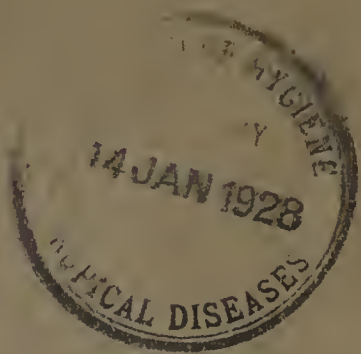


COLONY AND PROTECTORATE OF KENYA.



# ANNUAL MEDICAL REPORT

FOR THE

YEAR ENDING 31<sup>st</sup> DECEMBER, 1926,

INCLUDING

## THE ANNUAL REPORT

OF THE

## MEDICAL RESEARCH LABORATORY

FOR THE YEAR

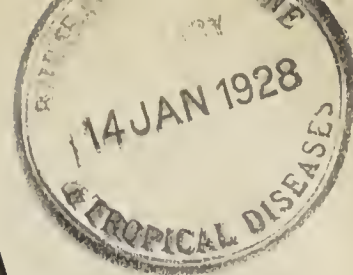
1926.







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FOR THE YEAR

1926.

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No. 16/705/27.

MEDICAL DEPARTMENT,

HEAD OFFICES,

NAIROBI, 17th June, 1927.

Sir,

I have the honour to submit for the information of His Excellency the Governor and for transmission to the Right Honourable the Secretary of State, the Medical Report on the Health and Sanitary Conditions of the Colony and Protectorate of Kenya for the year 1926, together with the Returns, etc., appended thereto.

I have the honour to be,

Sir,

Your obedient servant,

JOHN L. GILKS,

Director of Medical and Sanitary Services.

The Honourable,

The Ag. Colonial Secretary,

NAIROBI.







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# I. ADMINISTRATION.

## SECTION 1.—DEPARTMENTAL.

### 1.—ESTABLISHMENT. - 26

The year 1926 has been an eventful year in the history of the Medical Department by reason of the number of medical officers added to the establishment. The need for expansion was explained in last year's Report, and details were given of the extent to which expansion was intended to take place during 1926.

At the end of 1925 the total establishment of the Department in medical officers was 35. The allocation of appointments was as under:—

1. ADMINISTRATIVE DIVISION: 3 Officers: 3 posts.

Director of Medical and Sanitary Services.  
Deputy Director of Medical Service.  
Deputy Director of Sanitary Service.

2. MEDICAL DIVISION: 25 Officers: 16 posts.

A Senior Medical Officer or Medical Officer at each of the following posts:—

Nairobi: European Hospital.  
Native Hospital.  
Native Dispensary.

Mombasa: European Hospital.  
Native Hospital.

Kisumu: European and Native Hospitals.

Native

Reserves: Coast Area (Malindi District).  
Machakos.  
Fort Hall.  
Meru.  
Masai Province.  
Central Kavirondo.  
Kakamega.  
Kisii.  
Northern Frontier.  
Sleeping Sickness Investigation.

3. SANITATION DIVISION: 4 Officers: 3 posts.

A Sanitation Officer at:—

Nairobi.  
Mombasa.  
Kisumu.

4. LABORATORY DIVISION: 3 Officers: 3 posts.

Director of Laboratory.  
Senior Bacteriologist.  
Bacteriologist.

The number of additional Officers provided for in 1926 Estimates was 20, and the additional posts which were to be opened in consequence were as under:—

1. ADMINISTRATIVE DIVISION: 2 Officers: 2 posts.

Senior Medical Officer.  
Senior Sanitation Officer.

2. MEDICAL DIVISION: 11 Officers: 10 posts.



A Senior Medical Officer for Native Labour, and a Medical Officer for each of the following posts :—

2nd Medical Officer Coast Area.  
 „ „ „ Machakos.  
 „ „ „ Fort Hall.  
 „ „ „ Kisumu.  
 „ „ „ Kakamega.  
 Turkana.  
 Kitui.

and 2 Medical Officers to be attached to the Native Hospital, Nairobi.

3. SANITATION DIVISION : 5 Officers : 3 posts.

Assistant Medical Officer of Health, Nairobi.

„ „ „ „ „ Mombasa.

Medical Officer of Health, Nakuru.

The Medical Officer of Health at Nairobi and Mombasa becoming a Senior Sanitation Officer.

4. LABORATORY DIVISION : 2 Officers : 2 posts.

2 Bacteriologists.

There is set out below a table showing the position at the end of the year as regards the total number of posts and of Officers available for filling them, resulting excess of Officers for relief of those on leave, and the excess which should be allowed at the normal ratio of one Officer on leave for every three in the country :—

	Posts to be filled.	Total No. of Officers.	Excess of Officers over posts.	Normal ex- cess required for leave.
MEDICAL DIVISION ... .. (including Administrative Medical Officers).	29	39	10	9.75
SANITATION DIVISION ... .. (including Administrative Sanitation Officers).	7	10	3	2.5
LABORATORY DIVISION ... ..	5	5	—	1.25
TOTAL ...	41	54	13	13.5

It follows that if the establishment is kept up to full strength, and if the leave roster is suitably adjusted, then the staff as provided for in 1926 will be barely sufficient to keep filled all the posts proposed : but there is no provision for casualties, and no provision for emergency duties. Therefore the defection of any Officer from sickness or other cause, or any appointment for special duty, will necessitate the removal of an Officer from one of the existing appointments. So also it will be impracticable with the staff as sanctioned to open up any new posts or undertake any new work.

During the year out of the 20 new appointments sanctioned no less than 17 were filled. The Department was, by the end of the year, brought up to within 4 of its full strength of medical officers, the vacancies remaining unfilled including 1 Sanitation Officer and 2 Bacteriologists.

Of the new senior appointments, one Senior Medical Officer was promoted from the service and one from Zanzibar : the 3 appointments of Senior Sanitation Officer were filled by promotion of 2 of the 4 existing Sanitation Officers and of one Officer from the Laboratory Division who had previously held the post of Sanitation Officer.

Vacancies on account of these promotions were filled by newly appointed Officers.

Such an influx of new and inexperienced Officers naturally necessitated some modification of the original scheme of expansion of departmental work. But the decision to develop existing stations rather than to open up new stations, with the advent of additional staff, was not only due to the inexperience, and therefore the need of training, of the new Officers : two other considerations have been involved. The first is lack of housing and hospitals. It has been impossible to post Medical Officers to certain stations where they are needed, because there are no houses in which they can live. For this reason Kitui, by the end of 1926, had not had posted to it the Medical Officer provided for that station in 1925 Estimates. Such additional Medical Officers as have been sent



out into the Native Reserves have gone under extremely unsatisfactory conditions of housing: at Machakos, at Fort Hall, at Kakamega, the second Medical Officer is living in a grass hut. The Medical Officer, Malindi District, lives in a borrowed house: the Medical Officer, Digo District, has to find a lodging in Mombasa.

The second consideration which has prevented the rapid expansion of departmental work, which might appear justified by the increase in staff, is the prospect of 1928, when nearly all the new Officers appointed in 1926 will be falling due for leave. Estimates for 1927 only allow for 2 additional Medical Officers, one of them a Lady Doctor, the other intended for the special post of Officer-in-Charge of the Kenya African Medical Corps. What additions may be possible in 1928 cannot be foretold. The complete programme of expansion, of which the 1926 additional staff was the first instalment, comprised a total of 47 new Medical Officers, which number was estimated as sufficient to maintain 35 new posts with a proportion of one Officer on leave to every three in the country: these new posts included 6 emergency Officers as a reserve to make good casualties and to meet any sudden need. With the 20 Officers sanctioned for 1926, and without a guarantee of further additions, it will prove difficult to maintain during 1928 and 1929 even the new work at present being developed.

The increase in Medical Officers was supplemented by additions of other European staff. These included:—

1. ADMINISTRATIVE DIVISION.						Sanctioned.	Appointed.
Clerks	...	...	...	...	...	2	2
2. MEDICAL DIVISION.							
Dispenser	...	...	...	...	...	1	1
Nursing Sisters	...	...	...	...	...	6	6
Male Nursing Orderlies	...	...	...	...	...	2	—
3. SANITATION DIVISION.							
Senior Sanitary Inspector	...	...	...	...	...	1	—
Sanitary Inspectors	...	...	...	...	...	8	1
Sanitary Overseers	...	...	...	...	...	5	—
Nursing Sisters	...	...	...	...	...	2	2
4. LABORATORY DIVISION.							
Entomologist	...	...	...	...	...	1	—
Laboratory Assistants	...	...	...	...	...	3	3
Laboratory Learners	...	...	...	...	...	3	2

## 2.—DEPARTMENTAL ORGANISATION.

The introduction of the new Regulations for the East African Medical Service, with the changes in title of the senior administrative posts, would seem to require an altered view of the organization of the Department.

Previously the Department had as its head a Principal Medical Officer, with whom was a Deputy Principal Medical Officer. There was also a Chief Sanitation Officer as the head of the Sanitation Section of the Department. As another section of the Department there was the Laboratory, of which the Officer in charge was styled Senior Bacteriologist.

Under this system the head of the Department had the assistance of his Deputy in dealing with by far the greater part of the Departmental work, only purely sanitary or laboratory concerns being dealt with direct between the Principal Medical Officer and the Chief Sanitation Officer or Senior Bacteriologist. The Headquarters Office was organized on this basis, there being one Office Superintendent, one Accountant, one Storekeeper and one common staff of clerical and other assistants.

The new Regulations have introduced a completely new organization. Instead of there being as heretofore a head of the Department with his deputy head, and a head of a section, there is now a head with two sectional heads. In effect the Department has been sub-divided into sub-departments although necessarily these must be interdependent. The appointment of a Staff Officer will be found to be a necessity in order to allow the head of the Department to cope with the amount of work which will result from the fact that one sub-department cannot function independently of the rest.

### Administrative Division.

The work of the Administrative Division has been greatly helped by the appointment of a Senior Medical Officer and Senior Sanitation Officer to assist the Deputy Director of Medical Service and Deputy Director of Sanitary Service. These additional Officers could only have been included in the Headquarters staff by greatly extending the office accommodation. Most fortunately this extension was achieved during the year. In September the



entirely unsuitable and inadequate offices in the neighbourhood of the Railway Workshops, which had formed the Head Offices of the Department since its inception, were evacuated by Headquarters, and the new offices were occupied. These new offices, though only temporary structures of wood and iron, are well situated, well planned, and commodious. They now accommodate the Director of Medical and Sanitary Services; Deputy Director of Medical Service; Deputy Director of Sanitary Service; Senior Medical Officer, Headquarters; Senior Medical Officer, Native Labour; Senior Sanitation Officer, Headquarters; Chief Sanitary Inspector; and the Headquarters Accounting and Clerical staff. The Medical Stores and Storekeeping staff only remain in the old building.

During the latter half of 1926 Dr. J. L. Gilks, Director of Medical and Sanitary Services, was absent on leave. Dr. C. J. Wilson, Deputy Director of Medical Service, was appointed Ag. Director of Medical and Sanitary Services, and Dr. A. D. Williams, Senior Medical Officer, Headquarters, who had acted during the previous year as Ag. Deputy Director of Medical Service, was re-appointed to that post.

#### **Medical Division.**

The Medical Division, consisting of 6 Senior Medical Officers and 20 Medical Officers, comes directly under the Deputy Director of Medical Service.

The Senior Medical Officer attached to Headquarters undertakes a large amount of routine administration, such as control of expenditure, upkeep of hospitals, supervision of storekeeping.

The Senior Medical Officer at the Native Hospital, Nairobi, has now become in effect Senior Medical Officer in charge of Nairobi, for with the exception of the European Hospital and the Health Office all other medical activities have been placed under his supervision, viz., Native Dispensary, Railway Dispensary, Prison Hospital, Infectious Diseases Hospital, Venereal Clinics, Mathari Mental Hospital, etc.

During the year there have been from three to four junior Medical Officers employed in Nairobi. One of these in charge of Prison, Infectious Diseases Hospital, Venereal Clinics and Reformatory, was formerly under supervision by the Medical Officer of Health, but has now been placed under the Senior Medical Officer. The others, attached to the Native Hospital, are engaged in clinical work there, while one has medical charge of the King's African Rifles and another is directly responsible for the work at the Native Dispensary: these Officers are also called on for administration of anæsthetics at the European Hospital, and for visiting official patients in certain outlying districts of the town.

The Mathari Mental Hospital during the second half of the year was placed in the care of the Ag. Resident Surgical Officer at the European Hospital. Later it reverted to the charge of a Medical Officer attached to the Native Hospital, but has been placed under supervision by the Senior Medical Officer in order to ensure the experienced control, and continuity of administration, so necessary for the smooth working of this institution.

Outside Nairobi the work of Medical Officers is not co-ordinated in any system of decentralized control, since practical difficulties have prevented that delegation of authority to Senior Medical Officers which would otherwise have been attempted. Newly joined Medical Officers have been posted to stations, for the purpose of acquiring experience under the guidance of older Officers, at Machakos, Fort Hall, Kisumu and Kakamega; but apart from this all Medical Officers correspond direct with Headquarters. For more complete co-ordination of departmental work in the various Provinces, for further co-operation with Administrative Officers and Officers of other Departments, and to relieve the Medical Headquarters Staff, some system of decentralization is much to be desired.

#### **Sanitation Division.**

The Sanitation Division was organized during 1926 to include a Senior Sanitation Officer and Chief Sanitary Inspector at Headquarters, to assist the Deputy Director of Sanitary Service. The appointments of Medical Officer of Health, Nairobi and Mombasa, were made Senior Sanitation Officers' posts, and to each of these towns a Sanitation Officer was appointed as Assistant Medical Officer of Health. The Sanitation Staff at Nairobi included a Senior Sanitary Inspector and 6 Sanitary Inspectors, that at Mombasa a Senior Sanitary Inspector and 7 Sanitary Inspectors. Two Nursing Sisters, engaged in out-patient clinics, infant welfare work and district visiting, were attached to each of these Health Offices.

The Infectious Diseases Hospital at Mombasa remained under the care of the Health Office, but the Infectious Diseases Hospital, Nairobi, was transferred to the Medical Division. It has been suggested that the work of the Health Sisters, in so far as it is concerned with clinical work, should not remain as part of the Health Office functions.



At Kisumu there was one Sanitation Officer with one Sanitary Inspector.

It is proposed to open a Health Office at Nakuru (where a Sanitary Inspector was employed for the latter part of the year) for Nakuru, Eldoret and Kitale Townships and the Nakuru Uasin Gishu and Trans Nzoia Districts.

A Sanitary Overseer was employed throughout the year on vaccination in the Native Reserves.

#### **Laboratory Division.**

The organization of the Laboratory Division is described in its own Annual Report. It will be seen that the Entomologist was included in this Division.

### **3.—NEW WORK INAUGURATED DURING 1926.**

The new work inaugurated, with the help of the additional staff, may be summarised as follows:—

#### **Nairobi.**

The additional staff, of newly joined Medical Officers, available for duty at the Native Hospital, enabled more thorough and systematic clinical records of cases to be undertaken. The large number of patients provides a wealth of material for the study of native diseases, and, since the help of the Laboratory can be enlisted for the investigation, it should be possible to build up a foundation of exact knowledge. Routine post-mortem examinations, of the most complete character, are an important part of this study. In the past it has not proved possible to devote adequate attention to systematic examinations and records, since the time of the meagre staff has been fully occupied in practical curative work, and the consequent lack of exact knowledge of native pathology is a serious handicap in the work of the Department. It is to be hoped that Medical Officers, as they join the service, will appreciate the real value of careful and systematic investigation of all clinical cases, by which alone can they themselves become acquainted with conditions of disease in Africans, and at the same time lay the foundation of scientific knowledge.

One Medical Officer was detached for duty in connexion with outlying institutions, such as the Prison Hospital, Kabete Reformatory, the Infectious Diseases Hospital, and Venereal Disease clinics. As the result of his work valuable information has been obtained with regard to syphilis, yaws and helminthic infections. In this work the Laboratory played a large part, while great assistance was afforded by the staff of the Veterinary Research Laboratory in the investigation of helminths.

#### **Mombasa and the Coastal Area.**

The long-felt and frequently expressed want for more medical assistance for the coastal population was met by posting Medical Officers to the Malindi and Digo Districts. In each District, however, the work is much impeded by the lack of a hospital and a house. All that has been done is to institute out-patient dispensaries in suitable centres throughout the Districts, as the first step towards establishing a more adequate medical service, which should of course include a permanent hospital for in-patients.

An Assistant Surgeon, with a team of native dressers, was sent on tour in the Tana Valley to investigate the reported heavy incidence of yaws, and undertake the treatment of as many cases as might be accessible.

#### **Machakos and Kitui Districts.**

By posting a second Medical Officer to Machakos it was possible for the Medical Officer in charge to spend more time on tour, and develop the work of the out-dispensaries in a more satisfactory manner than can be accompanied by flying visits by motor car. It is unfortunate that lack of housing accommodation at Kitui prevented posting a Medical Officer to that station during 1926.

#### **The Kikuyu Province.**

A second Medical Officer was posted to Fort Hall, to relieve the Medical Officer in charge of some of the many duties of that station. Further, it was possible towards the end of the year, to detail an Officer for temporary duty in the Keruguya sub-district of South Nyeri, where there is a dense population relatively out of reach of medical aid, and where yaws is rife.

#### **The Nyanza Province.**

A second Medical Officer at Kisumu lightened the work of the Native Hospital, and allowed two out-dispensaries, previously under the care of the Medical Officer of Central Kavirondo, to be supervised from Kisumu.

A second Medical Officer at Kakamega assisted the work at the large Native Hospital, and in the District.



It is unfortunate that no assistance could be afforded to the Medical Officer of the South Kavirondo District, who still has sole charge of the Native Hospital at Kisii, and the whole of that large District.

The Medical Officer detailed for Sleeping Sickness investigation was engaged during the latter part of the year in carrying out a census of the Lake shore population of Central Kavirondo.

#### **Native Labour.**

A Senior Medical Officer was appointed for the special purpose of attending to the hygienic welfare of native labour. The economic value of measures directed towards an improvement of the health of the employed native is being more and more realised; it is intended that the function of this Officer should be to investigate, advise and persuade, so that the willing co-operation of employers may be obtained in carrying out the necessary hygienic reforms.

#### **Sanitation and Laboratory Division.**

The new work instituted by these Divisions is mentioned elsewhere in the special sections of this Report.

### **4.—ORGANIZATION OF NATIVE SUBORDINATE STAFF.**

It is a matter for great regret that no material progress was made with the scheme for the formation of a Kenya African Medical Corps, as outlined in last year's Report. The need of a disciplined Native Medical Staff is most urgent. The whole of the work of the Department, in every phase, is hampered by the inefficiency of the Native Staff. Technical knowledge is easily acquired by the African but a sense of responsibility, pertinacity, honesty and general trustworthiness are woefully lacking.

The inauguration of the Corps has been delayed by lack of a depot, erection of the necessary buildings having been prevented by uncertainty of the site. The depot must be sited near the Nairobi Native Hospital: the existing Native Hospital is to be transferred from its present site, and the future site is not yet determined. Until the situation of the new Native Hospital is decided, it would seem that further progress with systematic training of African Staff must be delayed. Much technical instruction has been given at the Native Hospitals, especially at Nairobi through the agency of the Senior Nursing Sister, but the formation of a disciplined strictly regulated corps has not yet materialized.

The employment of a few female natives in the female wards at the Nairobi Native Hospital has been practised for some time past. Instruction has been given by the European nursing staff. The system has been extended at Mombasa and the results have been promising. The difficulty of obtaining suitable candidates is being overcome with the aid of the Church Missionary Society and women with a certain amount of general education, without which technical instruction is almost impossible, have been forthcoming in small numbers. As with the male dressers instruction is not systematized and can only be given when pressure of work allows.

In one other instance successful training of natives was carried out: two selected candidates were put through a prolonged and thorough course of instruction in dispensing, at the General Dispensary, Nairobi. The results were most satisfactory, so much so that one of these native compounders is now in independent charge of the dispensing at the Native Hospital, Nairobi.

### **5.—LIBRARY, PUBLICATIONS AND PROPAGANDA.**

The Medical Department Library is housed in the Laboratory, and superintended by the Laboratory Staff. The contents, comprising both books and periodicals, has been carefully indexed, and copies of the index circulated to all Medical Officers, as well as to the private practitioners of the Colony. By this means it is expected that more use will be made of the Library for reference purposes. In order that a useful selection of suitable books and periodicals shall from time to time be added, it is proposed to put the control of the Library under a committee consisting of the Deputy Director of Medical Service, Deputy Director of Sanitary Service, and the Director of Laboratory, who will be responsible for recommending all purchases.

The Kenya Medical Journal continued publication throughout the year: the scope of the Journal has extended in other parts of East Africa, while the articles appearing in it have attracted attention in other Medical Journals in England and elsewhere. The Journal affords a means for the ventilation of current problems, and affords an opportunity for the publication of articles of medical interest which might not otherwise see the light. The Kenya Medical Journal is mentioned in this Report because it is intimately connected with the work of the Department; but financially it is independent of Government, being entirely self-supporting, and the Editorial and other work involved in its publication forms no part of the official duty of the departmental staff, but it is voluntarily undertaken.



A Health Pamphlet on the Housing of Native Labour was produced during the year, for the information and instruction of European employers. A series of articles on the housing, feeding and general hygiene of native labour was also published in the local press.

### ESTABLISHMENT.

The establishment of the Medical Department as sanctioned for the year 1926 was as follows :—

#### Administration Division.

Director of Medical and Sanitary Services	...	...	...	...	...	...	1
Deputy Director of Medical Service	...	...	...	...	...	...	1
Deputy Director of Sanitary Service	...	...	...	...	...	...	1
Senior Medical Officer	...	...	...	...	...	...	1
Senior Medical Officer of Health	...	...	...	...	...	...	1
Chief Sanitary Inspector	...	...	...	...	...	...	1
Medical Storekeeper	...	...	...	...	...	...	1
Office Superintendent	...	...	...	...	...	...	1
Accountant	...	...	...	...	...	...	1
Clerks	...	...	...	...	...	...	5
Stenographers	...	...	...	...	...	...	7
1st Grade Clerks	...	...	...	...	...	...	3
2nd Grade Clerks	...	...	...	...	...	...	15
4th Grade Clerks	...	...	...	...	...	...	2
2nd Grade Issuers of Medical Stores	...	...	...	...	...	...	2
Messengers, Packers, Office Boys, etc.	...	...	...	...	...	...	18

#### Medical Division.

Resident Surgical Officer	...	...	...	...	...	...	1
Senior Medical Officers	...	...	...	...	...	...	5
Medical Officers	...	...	...	...	...	...	45
District Surgeons	...	...	...	...	...	...	3
Assistant Surgeons	...	...	...	...	...	...	2
Dispensers	...	...	...	...	...	...	3
Matron	...	...	...	...	...	...	1
Nursing Sisters	...	...	...	...	...	...	29
Male Nursing Orderlies	...	...	...	...	...	...	3
Wardmaster	...	...	...	...	...	...	1
Superintendent, Mental Hospital	...	...	...	...	...	...	1
Matron, Mental Hospital	...	...	...	...	...	...	1
Assistant Matron, Mental Hospital	...	...	...	...	...	...	1
Warders, Mental Hospital	...	...	...	...	...	...	2
Assistant Surgeons	...	...	...	...	...	...	3
Sub-Assistant Surgeons	...	...	...	...	...	...	22
Compounders	...	...	...	...	...	...	8
Motor Car Drivers	...	...	...	...	...	...	5
Native Hospital Attendance	...	...	...	...	...	(as necessary)	
Mental Hospital Attendants	...	...	...	...	...	(as necessary)	

#### Sanitation Division.

Senior Sanitation Officers	...	...	...	...	...	...	2
Sanitation Officers	...	...	...	...	...	...	18
Senior Sanitary Inspectors	...	...	...	...	...	...	3
Sanitary Inspectors	...	...	...	...	...	...	36
Sanitary Overseers	...	...	...	...	...	...	6
Superintendent of Infectious Diseases Hospital	...	...	...	...	...	...	1
Nursing Sisters	...	...	...	...	...	...	8
Vaccinators	...	...	...	...	...	(as necessary)	
Native Attendants for Infectious Diseases Hospital, Leper Lazarettos and Quarantine Stations	...	...	...	...	...	(as necessary)	
Mechanics and Greasers	...	...	...	...	...	...	3

#### Laboratory Division.

Bacteriologist	...	...	...	...	...	...	1
1st Assistant Bacteriologist	...	...	...	...	...	...	1
Assistant Bacteriologists	...	...	...	...	...	...	4
Government Analyst	...	...	...	...	...	...	1
Chemical Officer	...	...	...	...	...	...	1
Entomologists	...	...	...	...	...	...	2
Laboratory Assistants	...	...	...	...	...	...	4
European Laboratory Assistants (Learner Grade)	...	...	...	...	...	...	4



1st Grade Laboratory Assistant	...	...	...	...	...	1
2nd Grade Laboratory Assistant	...	...	...	...	...	1
3rd Grade Laboratory Assistants	...	...	...	...	...	2
Clerk, 3rd Grade	...	...	...	...	...	1
African Laboratory Assistants (Learner Grade)	...	...	...	...	...	12
Native Laboratory Attendants	...	...	...	...	...	(as necessary)

## SECTION II.—EXTRA DEPARTMENTAL.

### 1.—REGISTRATION OF MEDICAL PRACTITIONERS AND DENTISTS.

The Ordinance governing registration came into force on the 24th September, 1910.

Since that date and up to the end of the year the following have been placed on the Register :—

Registered Medical Practitioners	...	...	...	...	190
Licensed Medical Practitioners	...	...	...	...	6
Dentists	...	...	...	...	18

One hundred and one medical practitioners were registered for Government service, and eighty-nine as private practitioners.

In 1926 forty new entries were made in the register, five dentists, twenty-one private medical practitioners, and fourteen members of the Government medical service. Of the new private practitioners five had gained their diplomas in India.

The Board nominated for the purposes of the Ordinance consisted of :—

The Director of Medical and Sanitary Services, (Chairman).  
 Dr. A. R. Paterson.  
 Dr. C. J. Wilson, M.C.,  
 Dr. W. H. Kauntze, M.B.E.,  
 Dr. A. J. Jex-Blake,  
 Dr. R. W. Burkitt.

with the Director of Medical and Sanitary Services as Chairman and Registrar.

One meeting was held during the year.

### 2.—THE DRUGS AND POISONS ORDINANCE, 1909.

This Ordinance controls the licensing of chemists and druggists as well as the sale of poisons throughout the country.

Forty-four names have been placed on the Register since the introduction of the Ordinance to the end of 1926.

The Board appointed under the Ordinance consisted of the following :—

The Director of Medical and Sanitary Services (Chairman),  
 Dr. A. R. Paterson,  
 Dr. C. J. Wilson, M.C.,  
 Dr. W. H. Kauntze, M.B.E.,  
 A. A. White, Esq., M.P.S.,  
 L. A. Howse, Esq., M.P.S.

with the Director of Medical and Sanitary Services as Chairman and Registrar.

Five meetings were held during the year.

### 3.—THE PUBLIC HEALTH ORDINANCE, 1913.

The Board established under this Ordinance deals with proposals for the sub-division into building sites of land in the neighbourhood of townships. Four meetings were held during the year.

The Annual Report of the proceedings of the Board will be found in Appendix "A."

### 4.—THE PUBLIC HEALTH ORDINANCE, 1921.

Under this Ordinance there is established a Board—the Central Board of Health—with the Director of Medical and Sanitary Services as Chairman. The function of the Board is to advise the Governor on any matter affecting the public health.

Five meetings were held during the year.

The Annual Report of the proceedings of the Board will be found in Appendix "B."



### SECTION III.—FINANCIAL.

The total of the sanctioned estimates for the Medical Department for the year 1926 was £178,964, an increase of £44,933 over the previous year.

The total for personal emoluments was increased by £22,347 to allow for the following new appointments :—

- 2 Senior Medical Officers.
- 1 Senior Sanitation Officer.
- 10 Medical Officers.
- 3 Sanitation Officers.
- 2 Assistant Bacteriologists.
- 1 Entomologist.
- 1 Senior Sanitary Inspector.
- 8 Sanitary Inspectors.
- 5 Sanitary Overseers.
- 10 Nursing Sisters.
- 2 Male Nursing Orderlies.
- 2 European Clerks.
- 6 Stenographers.
- 3 Laboratory Assistants.
- 4 Laboratory Assistants (Learner Grade).

Two new Votes appeared, one under the heading "Contribution to International Commission on Sleeping Sickness," for which a sum of £450 was provided, and the second under the heading "Extraordinary Expenditure, Leper Lazarette for which £1,000 was provided."

The comparative table of the sanctioned estimates and expenditure of the Medical Department for the past three years is as follows :—

Year			Sanctioned Estimates	Sanctioned Extra- ordinary Estimates	Total Sanctioned	Actual Recurrent Expenditure	Actual Extra- ordinary Expenditure
			£	£	£	£	£
1924	...	...	126,593	350	126,943	118,688	188
1925	...	...	134,031	375	134,406	132,637	320
1926	...	...	178,964	1,000	179,964	160,654	Nil

The actual expenditure in the year was £19,310 less than the sanctioned total.

The revenue collected amounted to £18,181 as against £16,240 in 1925.

Of the total estimated expenditure in 1926 of £2,388,753 for the Colony and Protectorate, £179,964 represented expenditure on Public Health and Medical Relief, a ratio of 1 to 13.27 or 7.5 per cent.

Detailed returns of the revenue and expenditure are given in Table II. at the end of the Report.

## II.--PUBLIC HEALTH.

### POPULATION.

Apart from the European population, the only vital statistics available are those which have been obtained from the towns of Nairobi, Mombasa and Kisumu, as shown hereafter. Statistics of the Asiatic and African populations are not forthcoming, nor will they be until the system of registration of births and deaths, so long desired, is at last introduced.

The figures for the three large towns offer some indication of the health and mortality of the mixed populations of those towns: but they cannot be taken as accurate or complete in themselves and they certainly cannot be accepted as any guide to the state of the public health of the African Population outside the towns. Conditions of town life for the African are so essentially different from those under which he lives in the Reserve, or on the farm of a European, that no general deductions can be drawn from the statistics of the town. In certain directions town life offers advantages: for example epidemic disease is more strictly controlled, medical aid is more accessible. For certain classes housing and general sanitary conditions are of a more advanced type, and food is more abundant and varied. On the other hand a large proportion of town dwellers live in conditions of overcrowding and insanitation which are worse than anything experienced under "natural" circumstances, while their food may be less abundant and less varied than normally in the Reserve.



There are no statistics by which comparison may be made of the relative healthiness of the native when living in a town, on a farm, or in the Reserve. Reliable statistics of these three classes of the native population are urgently needed; without these it is difficult to estimate the effect of civilizing influences on native health.

#### GENERAL NATIVE POPULATION.

The state of health of the general native population during 1926, considered absolutely or relatively to preceding years, must be largely a matter of conjecture. It is certain that widespread incidence of malaria, of a severe type, during the first half of the year, caused a great deal of sickness, and probably a great number of deaths. For example, the Administrative Officer of the Kyambu District obtained information of one thousand deaths in his District during a period of two or three months, all of which were ascribed, by the natives who reported them, to the prevailing epidemic of malaria.

From reports of undue sickness received from other parts of the Colony it is not unlikely that a similar excessive mortality occurred elsewhere.

It must be admitted that as yet little impression has been made on the Native Reserves by sanitary measures: the native still lives and dies under age-long conditions of insanitation. Any improvement of health which may have been effected by medical efforts has been due to curative measures: any saving of other than single lives has been due to the prevention or suppression of the graver epidemic diseases. Sickness and death, the result of poor nutrition, poor housing, harmful habits and customs, and complete lack of sanitary precaution, remain uncontrolled.

The handful of Medical Officers scattered among the two and a half million African inhabitants of the Colony may be instrumental in saving a few individual lives, but the ignorance and apathy and superstition of the mass of the population must remain unaffected until effective measures of education have radically altered native ideas and customs.

There are reasons for believing that the next few years will see a definite advance towards a higher and healthier standard of living in the Native Reserves. Why that advance may be expected, and how it may be directed and assisted, is discussed in the Sanitation Section of this Report.

#### NAIROBI.

##### HEALTH AND MORTALITY—VITAL STATISTICS.

The compilation of vital statistics in connexion with the health of Nairobi remains an impossibility. A census was made during the year but in relation to the non-native section of the population only. Nothing more than a rough estimation of the number of natives living in the town is therefore available and such is useless for statistical purposes. Further, registration of births and deaths is a procedure which is required of a relatively small portion of the inhabitants only. Every death is reported to the Police in order to obtain the necessary burial permit but as this is issued merely on the production of a certificate of cause of death signed by a medical practitioner and as the person producing it is frequently ill-informed as to the particulars of the deceased it follows that little reliable information can be obtained from this procedure.

The total population being a matter of conjecture and the records as to the births and deaths being inadequate and often misleading it follows that an analysis of health conditions in the town is at present unobtainable.

The introduction of a system by which the collection of accurate vital statistics can be ensured becomes more urgently necessary from year to year.

The following figures are quoted in an attempt to do the best with the information available.

#### A—Population.

##### POPULATION OF NAIROBI MUNICIPAL AREA, 1926.

RACE.				Males.	Females.	Total.
Europeans.	...	...	...	1,450	1,215	2,665
Indians	...	...	...	5,247	2,494	7,741
Arabs.	...	...	...	60	16	76
Others.	...	...	...	940	442	1,382 *
						11,864
Africans (estimated).	...	...	...	...	...	21,000
						32,864
				Total all races.		32,864

\* Of this number 1,100 are estimated to be Goans.

The population in the last census year 1921 was 23,428.



**B—Births.**

119 births among Europeans were reported during the year as compared with 108 in 1925, 95 in 1924, 106 in 1923, 128 in 1922 and 142 in 1921. Of these births 59 were males and 60 females.

**C.—Marriages.**

The number of European marriages registered is 73.

**D.—Deaths.**

The total number of deaths from all causes reported as occurring in the Town during the year is 745, as compared with 390 in 1925, 530 in 1924, 575 in 1923, 504 in 1922, and 570 in 1921.

Assuming the total population of Nairobi Township to be 32,864 the crude death rate is 22.64 per thousand living.

Of the 745 deaths reported, 132 were among non-residents. 63 deaths among Nairobi residents occurred elsewhere than in Nairobi, the total number of deaths among residents (all races) is therefore 676, which yields a recorded death rate (all races) of 20.57 per thousand living as compared with 12.8 for the year 1925.

Of the 676 deaths 501 were males and 175 females.

36 occurred among Europeans equivalent to a rate of 13.5 per 1,000 Europeans.

270 „ „ Asiatics equivalent to a rate of 30.3 per 1,000 Asiatics.

364 „ „ Natives equivalent to a rate of 17.3 per 1,000 Natives.

6 „ „ Other Races.

A higher rate among Asiatics is to be expected in view of the fact that this section of the population includes more infants and aged persons than either of the other two.

As no figures are available as to age and sex distribution of the population in the town or in the country as a whole no corrected death rates can be obtained.

**E.—Infant Mortality.**

As the number of births is not known no infant mortality rate can be obtained. The number of deaths which occurred in infants under one year of age is 124 or 18.3 per cent. of the total deaths reported.

**Deaths Under One Year in Comparison to Total Deaths.**

Race.	Under one year.	All Ages.	Percentage.
European ...	7	36	19.4
Asiatic ...	94	270	34.8
Native ...	23	364	6.3

**Cause of Infant Deaths.**

Pneumonia ...	30
Prematurity ...	14
Diarrhoea ...	13
Malaria ...	12
Asphyxia ...	10
Marasmus ...	5
Heart Failure ...	2
Meningitis ...	1
Lymphatic Leucaemia ...	1
Other Causes ...	36
	<hr/> 124 <hr/>

As usual the disease which caused the greatest loss of infant life was pneumonia. Diarrhoea and other intestinal diseases do not play as great a part in infant mortality as the existing conditions, climatic and otherwise, would lead one to expect.

The difficulty which is experienced in obtaining accurate information as to the age of infants renders it impossible to indicate the age distribution of infant deaths.

The importance of obtaining detailed statistics as to infant mortality cannot be over-emphasized.



**F.—General Mortality.**

The chief cause of death was pneumonia which was accountable for 171 deaths or 26 per cent. of total deaths as compared with 121 in 1925 (31 per cent.) ; 141 in 1924 (26 per cent.) ; 164 in 1923 (28.5 per cent.) and 170 in 1922 (31.5 per cent.). The death rate from this disease is 5.2 per thousand living.

Malaria caused 130 deaths as compared with 19 in 1925, and 32 in 1924, and was thus responsible for 19.2 per cent. of the total deaths and yielded a death rate of 3.9 per thousand living.

Plague accounted for 32 deaths as compared with 4 in 1925 and 61 in 1924.

Tuberculosis was given as the cause of 17 deaths, the figures for 1925 and 1924 being 14 and 21.

Dysentery caused 9 deaths and Typhoid and Para-typhoid fevers 4.

Diseases of the Circulatory, Respiratory (other than pneumonia) Digestive and Nervous systems produced 40, 25, 27 and 13 deaths respectively, 35 are due to general diseases and 64 to unspecified causes, the latter being deaths among natives who had not been seen by a medical practitioner prior to death and upon whom no post-mortem examination was made.

The number of deaths during the year was markedly higher than that recorded during the last few years, most of the more fatal diseases yielding higher figures than latterly.

Malaria and Plague both occurring in epidemic form during the year were responsible for a considerable rise in the number of deaths reported.

**G.—Notifiable Infectious Diseases.**

During 1926, the total number of cases of infectious disease occurring in the Township and reported to the Medical Officer of Health was 321, as compared with 206 in 1925. The increase in this figure is due largely to the prevalence of measles and plague, but in part to the fact that medical practitioners are becoming more punctilious in the notification of cases of infectious disease coming under their notice. In this regard, however, it must be stated that the interval which commonly elapses between diagnosis and notification still leaves something to be desired.

**NOTIFIABLE INFECTIOUS DISEASES.**

			Cases Notified.		Number of Deaths.		Death rate per 1,000 Population.
			1925.	1926.	1925.	1926.	1926.
Anthrax	...	...	5	3	—	—	—
Beri beri.	...	...	2	—	—	—	—
Cerebro Spinal Fever.			8	7	3	5	0.15
Diphtheria	...	...	1	5	—	3	0.09
Erysipelas	...	...	—	1	—	—	—
Leprosy	...	...	9	14	—	1	0.03
Malta Fever	...	...	3	3	—	—	—
Measles	...	...	17	101	—	2	0.06
Plague	...	...	8	43	4	32	0.97
Relapsing Fever	...	...	46	27	3	2	0.06
Smallpox	...	...	1	1	—	—	—
Trypanosomiasis	...	...	—	1	—	1	0.03
Tuberculosis	...	...	44	47	14	17	0.51
Typhoid and Para-typhoid Fever	...	...	15	28	5	4	0.12
Typhus Fever	...	...	7	2	—	—	—
Whooping Cough	...	...	—	1	—	—	—
Yaws	...	...	37	26	—	—	—

**MOMBASA.****HEALTH AND MORTALITY—VITAL STATISTICS.****A.—Population.**

A census of the non-native population of the Island was made during the year. The previous census was in 1921. During the intervening years the population was estimated by the Resident Commissioner.



The figures for 1921 and 1926 are given below, together with the estimated figures for 1925. The great divergence between the figures brought out in the census return and the estimated figures proves the necessity for the taking of more frequent census.

1921.					1925.			
	Male.	Fem.	Childn.	Total.	Male.	Fem.	Childn.	Total.
Europeans.	... 383	175	95	653	702	194	181	1,077
Indians.	... 2,896	1,506	2,900	7,302	2,471	1,020	1,596	4,987
Goans.	... 489	83	126	696	433	73	67	573
Arabs.	... 2,152	1,620	1,938	5,700	3,305	2,065	2,176	7,546
Others.	... —	—	—	—	74	37	42	153
Natives	... 7,438	6,826	3,719	17,983	9,839	7,219	6,075	23,133
				32,334	37,469			
1926.								
			Male.	Female.	Children.	Total.		
Europeans.	...	413	211	52	676			
Indians.	...	4,575	2,947	1,401	8,923			
Goans.	...	674	293	186	1,153			
Arabs.	...	3,588	2,442	1,653	7,683			
Others.	...	98	81	43	220			
Natives.	...	9,027	6,888	5,930	21,845			
					40,500			

It will be noted that, with regard to Europeans, there is a great divergence between the estimated figures of 1925 and the figures collected by census this year. Instead of there being an increase of 424 Europeans as indicated in 1925, the census figures show that there are only 24 more Europeans on the Island to-day than in 1921.

During the last five years there has been a considerable amount of building development in the area given over to European residences, all houses are occupied, and there still remains a great shortage of houses.

The number of European visitors to Mombasa, including those on vessels in harbour, on the day on which the 1926 census was taken is given as 176 males, 17 females, making a grand total of 869, divided as follows:—

589 males,  
228 females,  
52 children.

The total figure is more in accordance, in comparison with the 1921 figures, with the increased housing accommodation.

#### Indian Population.

Here, too, there appears some difference between the estimated population of 1925 and the census figure of 1926. Instead of there being a decrease in the Indian population as was indicated in 1925 a real increase in these races has been maintained—the actual recorded increase being one of 1,621 persons or 22 per cent. on the 1921 total.

#### Arab Population.

The unreliability of estimated figures is suggested by a study of the figures of population given below. It will be noted how the estimated figures varied in comparison with the census figures. In 1924 a decline in the Arab population was shown on the 1921 figure, a sudden rise in 1925, and a still further rise in 1926.

1921 Census	...	...	...	...	...	...	5,700
1924 (estimated)	...	...	...	...	...	...	5,250
1925 (estimated)	...	...	...	...	...	...	7,546
1926 Census	...	...	...	...	...	...	8,903

The Arab population of Mombasa has, it would now appear, increased by 3,223 in the five years since 1921, an increase of 50 per cent.

#### Goan Population.

The 1926 census shows that the people of this race have increased in five years by 457 persons—an increase of over 67 per cent.



### African Population.

The 1926 census was purely a non-native one, and the figures given for Africans are still founded altogether on estimates, and are, therefore, of a limited value for comparison with the 1921 figures. The estimated African population shows an increase of population since 1921, but a diminution on the estimate of 1925. It is difficult to reconcile this estimate with the apparently increased congestion throughout the town.

### The 1926 Census.

The figures arrived at by the 1926 Census are of considerable value, as giving what must be accepted as an accurate estimate of the non-native population of Mombasa to-day.

It is to be regretted that it was not found possible to take a census at the same time of the African population, giving those responsible in this country for compiling vital statistics some figures that could be considered accurate on which to base their calculations. In the past in Mombasa it has been the practice to base calculations on the data provided by estimated populations—data which the census has proved to be of very limited value.

### B.—Births.

The births registered in Mombasa during 1926 were as follows:—

Europeans	...	...	...	...	...	...	16
Asiatics (Goans and Indians)	...	...	...	...	...	...	41
Arabs	...	...	...	...	...	...	1
Other races	...	...	...	...	...	...	3
Total							61

as compared with 47 in 1925 and 49 in 1924.

There is still no compulsory registration of births other than amongst Europeans. The importance of making registration for all races compulsory in a town such as Mombasa cannot be too strongly emphasized.

To attempt to carry out a scheme for assisting and advising mothers in the proper care of their children without compulsory registration of births is almost impossible, and the work done to-day by the Health Sisters only touches the fringe of the distressing conditions existing amongst the larger sections of the population.

### C.—Marriages.

During the year the following marriages were registered:—

Europeans	...	...	...	...	...	...	60
Goans	...	...	...	...	...	...	4
Africans	...	...	...	...	...	...	9
Other races	...	...	...	...	...	...	1
							74

In 1925 there were 45 European marriages registered and in 1924 there were 12.

A number of marriages registered in Mombasa are contracts between people resident up-country.

### D.—Deaths.

The number of deaths reported during 1926 in the township is 776—males 478, females 298. The deaths reported amongst races were divided as follows:—

				Male.	Female.	Total
Europeans	...	...	...	8	1	9
Indians and Goans	...	...	...	127	79	206
Arabs	...	...	...	80	68	148
Africans	...	...	...	263	150	413
Total	...	...	...	478	298	776



The total number of deaths reported during the previous 10 years in Mombasa are appended for comparison.

No. of Deaths.				No. of Deaths.			
1916	...	...	633	1921	...	...	692
1917	...	...	676	1922	...	...	680
1918	...	...	977	1923	...	...	678
1919	...	...	723	1924	...	...	563
1920	...	...	1,284	1925	...	...	795

The only death-rate that can be estimated in this township on the records available is the crude death-rate—a rate of very little scientific value, and giving no information on which it is possible to form an opinion of existing health conditions.

Taking the total population as being 39,824 the crude death-rate works out at 19.48 per 1,000 living, as compared with 21.2 in 1925, and 13.40 in 1924.

The crude death-rate for various races works out as follows per 1,000 living :—

Europeans	...	...	...	...	...	...	13.31
Indians and Goans	...	...	...	...	...	...	23.37
Arabs	...	...	...	...	...	...	19.69
Africans	...	...	...	...	...	...	18.90

#### E.—General Mortality.

It is necessary before commenting on the figures available to make reference to the unsatisfactory system under which these figures are collected.

It will be apparent that in a system where post-mortem examinations are seldom or never made, and the majority of deaths are uncertified by a medical practitioner attending during the fatal illness, the records re causes of deaths are of very little accuracy, being based in nearly 60 per cent. of cases only on information obtained from relations or friends of the deceased.

The 776 deaths recorded during the year were certified for as follows :—

By Private Practitioners	...	...	...	...	171
By Medical staff, Native Civil Hospital, (deaths in hospital)	...	...	...	...	106
By Medical staff, European Hospital (deaths in hospital)	...	...	...	...	6
By Medical staff, Infectious Diseases Hospital, (deaths in hospital)	...	...	...	...	39
By Medical staff of Prison (deaths in Prison)	...	...	...	...	4
By Health Office staff, (from information collected)	...	...	...	...	450
					<u>776</u>

While the figures available with regard to deaths in Mombasa are unsuitable for the purpose of comparing conditions in Mombasa with those of towns and cities in other parts of the world, they are still of some interest in comparison with records obtained in the past under a similar system of inaccuracy as throwing some light on the conditions which re-act regularly on the health of the population.

In a detailed study of the causes of death it will be noted that during the year no serious epidemic occurred. In 1925 Mombasa was visited by small-pox and before the disease could be stamped out it accounted for 66 deaths. In comparing the death returns of this year with those of 1925 the figures could be brought to a state more suitable for comparison by deducting from the total figure for 1925 the deaths due to small-pox, making the total for that year 729. In 1924, a year also free from any serious epidemic, the deaths recorded only totalled 563.

The crude death rates in 1926 and 1924 if compared leave one with the opinion that other things being equal in both years, Mombasa so far as the general population is concerned is not steadily growing a healthier place in which to live.

Pneumonia once again heads the list of fatal diseases, being reported as responsible for 150 deaths or 20 per cent. of the total number of deaths. In 1925 pneumonia was responsible for 105 deaths or 13.2 per cent. of the total.

Other respiratory diseases are reported as causing 33 further deaths, as compared with 32 in 1925. Pulmonary tuberculosis is shown as the cause of



death in 69 cases, as against 67 in 1925. The diseases primarily associated with the respiratory system have caused 257 deaths or 33 per cent. of the total. One out of every three people who died succumbed to one or other of the respiratory diseases enumerated above.

However inaccurate the system of recording deaths may be there would appear to be in Mombasa grave cause for alarm and serious reason for considering how improvement can be brought about. Pneumonia, pulmonary tuberculosis and affections of the bronchial tubes are diseases primarily associated with over-crowding, bad lighting, and bad ventilation of houses. Throughout the Old Town and the African area of Mombasa not only are areas congested, but nearly all individual houses are overcrowded. The bulk of the population live in close contiguity one to the other, in badly lighted and ill-ventilated buildings.

Malaria is given as the cause of death in 84 cases, or 10.82 per cent. of the total number of deaths. In 1925 this disease caused 93 deaths or 11.07 per cent. of the total.

The year under review will go down in the medical history of Kenya as being associated with an epidemic of malaria of a severe type. It is particularly satisfactory to record that in Mombasa the mortality from this disease was less than that of the preceding year.

Diarrhoea and dysentery are given as the cause of death in 45 or 5.8 per cent. of the deaths reported. In 1925 the number was 87 or 11 per cent. of the total number of deaths.

A fair portion of the population of Mombasa still draws its water supply from wells situated in the congested areas, where the pollution of the underground water must be considerable.

Food in the majority of residences, markets, eating houses, etc., is exposed freely to all possible contamination by flies or dust. A large population exists to-day that fails to use latrine accommodation, and pollutes the ground not only in open spaces and on the sea-front, but in passages and courts in close vicinity to residences and markets.

In consideration of the above facts the comparatively small number of deaths from intestinal diseases is a matter of surprise.

#### F.—Infantile Mortality.

132 deaths of infants under one year were reported, making 17 per cent. of the total number of deaths recorded. In 1925 and 1924 the corresponding numbers were 147 or 18.14 per cent. and 109 or 19.4 per cent. respectively.

The causes of deaths in infants were recorded as follows:—

Bronchitis	...	...	...	...	...	5
Pneumonia	...	...	...	...	...	24
Pleurisy	...	...	...	...	...	1
Dentition	...	...	...	...	...	2
Dyspepsia	...	...	...	...	...	1
Diarrhoea	...	...	...	...	...	13
Colic	...	...	...	...	...	2
Enteritis	...	...	...	...	...	1
Malaria	...	...	...	...	...	12
Inanition	...	...	...	...	...	33
Infantile Convulsions	...	...	...	...	...	21
Heart Failure	...	...	...	...	...	1
Premature Birth	...	...	...	...	...	13
Hæmorrhage	...	...	...	...	...	1
Anæmia	...	...	...	...	...	1
Scurvy	...	...	...	...	...	1
Total						132

#### AGE DISTRIBUTION OF INFANTILE DEATHS REPORTED.

Under 4 weeks	...	...	...	...	51
4 weeks to 3 months	...	...	...	...	19
Total under 3 months	...	...	...	...	70
3 to 6 months	...	...	...	...	39
6 months to 1 year	...	...	...	...	23
Total under 1 year	...	...	...	...	132



It will be noted that 53 per cent. of the deaths in infants occur within the first three months after birth.

#### INFANTILE DEATHS REPORTED ACCORDING TO RACE.

Europeans	...	...	...	...	...	Nil
Anglo-Indians	...	...	...	...	...	1
Goans	...	...	...	...	...	1
Indians	...	...	...	...	...	63
Arabs	...	...	...	...	...	33
Other races	...	...	...	...	...	3
Africans	...	...	...	...	...	31
Total						132

#### C.—Notification of Infectious Diseases.

267 cases of infectious disease were notified during the year as compared with 382 in 1925 and 126 in 1924. 242 of the cases notified in 1925 were small-pox.

Below are details of cases notified during the last three years.

Disease.	1926	1925	1924
Cerebro Spinal Meningitis	1	3	4
Leprosy	15	6	5
Measles	131	22	2
Puerperal Fever	1	6	1
Small-pox	3	242	3
Typhoid	8	14	23
Tuberculosis	103	83	86
Relapsing Fever	2	—	—
Whooping Cough	1	3	—
Yaws	2	—	—
Plague	—	—	1
Erysipelas	—	—	1

It will be noted that measles occurred in epidemic form and that tuberculosis is again shewn to be a most serious infectious disease in Mombasa.

#### K I S U M U .

#### VITAL STATISTICS.

	1924	1925	1926
Europeans	141	116	141
Asiatics	950	1,200	1,303
Africans	5,050	6,000	6,212
Total	6,141	7,316	7,656

#### DEATHS.

Europeans	2	2	3
Asiatics	29	28	49
Africans	79	101	139
Total	110	131	191

#### CRUDE DEATH RATE PER 1,000 LIVING.

1924	17.9
1925	17.9
1926	24.9

#### CAUSES OF DEATHS.

(SPECIAL DEATH RATES PER 1,000 LIVING.)

Respiratory Diseases	1925	1926
	8.5	8.5



Tuberculosis	...	...	...	...	0.5	0.9
Malaria and Blackwater	...	...	...	...	1.0	3.8
Intestinal Diseases	...	...	...	...	2.0	3.4

#### INFANTILE MORTALITY.

As in 1925 an attempt was made to arrive at the infantile mortality rate among the various sections of the community by means of a house to house enquiry. The results are given in the following table:—

Section of the Population.	Number of births.	Number of deaths under one year.	Infantile mortality rate per 1,000 births.	Rate in 1925.
Africans employed by the Kenya and Uganda Railway ...	85	17	200	29
General African Population of the Town excluding Railway Employees ...	119	33	277	118
Indians employed by the Kenya and Uganda Railway ...	34	7	206	63
General Indian Population excluding Railway employees ...	42	13	314	200
Goans ...	11	1	91	—
Europeans ...	3	—	—	—

Though the figures on which these rates are based are small and of doubtful accuracy the increases in the infantile mortality rates which are suggested cannot be viewed but with disquietude. That these increases were due in part at least to an increase in the incidence of malaria is not improbable but unfortunately the data available is insufficient to allow of analysis. The table is only quoted in this report with a view to illustrating the imperative necessity for the institution of accurate registration of births and deaths.

#### EUROPEAN OFFICIALS.

Mention was made in last year's Report of Loan Proposals for provision of housing for officials. It must be recorded that practically no progress has yet been made with this much needed measure. Housing of officials in out-stations still remains inadequate and unsatisfactory. Where the amenities of town life are lacking, it is all the more important that some degree of comfort in the home should be possible; it is however the case that the homes of officials in many out-stations are comparatively comfortless, often even mean and insanitary. Improper housing results not only in loss of self-respect and prestige, but also in a general lowering of physical condition from mental depression, and in actual disease from insanitary conditions. With the general advance in the economic state of the Colony, and with the longer experience and greater knowledge of local conditions which are now available, the health of the European Official population should show an improvement: figures show that no such improvement has taken place. On the contrary the increase in morbidity which was commented on last year is even more marked in 1926. It should be noted, however, that the increase, 324, in the number of in-patients is almost entirely accounted for by the increase, 293, in the number of cases of malaria. It may be argued therefore that the increase in the amount of sickness among officials was one manifestation of the epidemic of malaria which affected all sections of the population.

The figures relating to in-patients and out-patients are as follows:—

	In-Patients.	Out-Patients.
1926	1,199	429
1925	875	504
1924	594	354

Deaths among European officials totalled 6, the same number as in 1925. The causes were:—

Sub-tertian Malaria	...	...	...	...	1
Blackwater Fever	...	...	...	...	2
Broncho Pneumonia	...	...	...	...	1
Cardiac Disease	...	...	...	...	1
Peritonitis	...	...	...	...	1



The number of invalidings which took place 25 was almost double that of the preceding year; these were due to:—

Debility	...	...	...	...	...	9
Neurasthenia	...	...	...	...	...	3
Malaria	...	...	...	...	...	3
Tuberculosis	...	...	...	...	...	2
Rheumatism	...	...	...	...	...	2
Cardiac Disease	...	...	...	...	...	1
Injuries	...	...	...	...	...	2
Mental Disease	...	...	...	...	...	1
Eye Disease	...	...	...	...	...	1
Hernia	...	...	...	...	...	1

The comparative table of the numbers of invalidings in the last three years is striking and is:—

1926	...	...	...	...	25 invalidings.
1925	...	...	...	...	13 „
1924	...	...	...	...	7 „

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES AMONGST EUROPEAN OFFICIALS IN THE COLONY AND PROTECTORATE OF KENYA.

	1924	1925	1926
Total number of officials resident	1,280	1,433	1,683
Average number resident	898	1,001	1,195
Total number on sick list	594	875	1,199
Total number of days on sick list	4,346	6,667	7,908
Average daily number on sick list	11.90	18.26	21.66
Percentage of sick to average number resident	1.32	1.82	1.81
Average number of days on sick list to each patient	7.31	7.61	6.59
Average sick time to each resident	4.85	6.66	6.61
Total number invalided	7	13	25
Percentage of invaliding to total residents	.54	.90	1.48
Total deaths	4	6	6
Percentage of deaths to total residents	.31	.34	.36
Percentage of deaths to average number resident	.45	.59	.50
Number of cases of sickness contracted away from residence	—	—	—

#### NON-EUROPEAN OFFICIALS.

No greater progress in the direction of the provision of housing for non-European officials has been made in 1926 than for European. The need is not less marked.

As was the case with European officials the sickness figures showed a large increase over those of 1925, but here also the increase, 1,117, in the number of in-patients is almost exactly paralleled by the increase, 1,126, in the number of cases of malaria.

The comparative table of figures for in-patients and out-patients is as follows:—

	In-Patients.	Out-Patients.
1926	4,772	932
1925	3,655	1,178
1924	2,554	1,050

Seven deaths occurred, a decrease in one from the preceding year. The causes were:—

Enteric	...	...	1
Disease of the Circulatory System	...	...	1
Broncho Pneumonia	...	...	2
Disease of the Digestive System	...	...	1
Acute Nephritis	...	...	1
Injuries	...	...	1

Invalidings totalled 17 as against 11 in 1925; they were due to:—



Debility	...	...	...	...	...	3
Neurasthenia	...	...	...	...	...	3
Injury	...	...	...	...	...	1
Hodgkins Disease	...	...	...	...	...	1
Tuberculosis	...	...	...	...	...	1
Mental Disease	...	...	...	...	...	2
Bright's Disease	...	...	...	...	...	1
Locomotor Ataxia	...	...	...	...	...	1
Eye Disease	...	...	...	...	...	2
Jaundice	...	...	...	...	...	1
Senility	...	...	...	...	...	1

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES  
AMONGST NON-EUROPEAN OFFICIALS IN THE COLONY AND  
PROTECTORATE OF KENYA.

	1924	1925	1926
Total number of officials resident	2,064	2,427	2,645
Average number resident	1,653	1,820	2,135
Total number on sick list	2,554	3,655	4,772
Total number of days on sick list	14,729	21,487	24,996
Average daily number on sick list	40.03	58.81	68.48
Percentage of sick to average number resident	2.44	3.23	3.20
Average number of days on sick list to each patient	6.53	5.90	5.24
Average sick time to each resident	8.91	11.89	11.70
Total number invalided	12	11	17
Percentage of invaliding to total residents	.58	.45	.64
Total deaths	5	8	7
Percentage of deaths to total residents	.24	.32	.26
Percentage of deaths to average number resident	.30	.44	.32
Number of cases of sickness contracted away from residence	—	—	—

### III.--MEDICAL SERVICES.

Recent Annual Reports have not contained a comprehensive and detailed survey of the curative aspect of the Department's activities. References have been made under such headings as "Administration," "Hospitals and Dispensaries," while certain work has been described in detail under "Major Endemic and Epidemic Diseases"; but it has not been the custom to devote a section of the Report to a regional survey of medical services throughout the Colony.

Although in this present Report, as in previous years, many particular features of departmental work are reviewed in other sections, it has been thought desirable to devote one section to an account of general medical work, considered district by district.

Details and statistics of the different hospitals will be found set out, in tabular form, in Chapter IX "Hospitals, Dispensaries and Institutions."

#### 1.—NAIROBI.

##### A.—European Population.

The Department is responsible for medical attendance on Government Officials, including those of the Railway. Patients attend at the European Hospital, or at the General Dispensary, or are visited in their quarters. In-patients are received at the European Hospital, which is open also for non-official patients. Such cases of infectious disease as cannot be nursed in their homes are admitted to the Infectious Diseases Hospital. Mental cases, if certified, are received at the Mathari Mental Hospital.

Apart from Government institutions there is one private nursing home and one maternity home; the number of European private practitioners is increasing.

During 1926 an experienced radiologist and electro-therapeutist established himself in Nairobi, and an arrangement was made by Government by which he assumed control of all radiological examinations, electro-therapeutic treatment, and massage, for official patients.



### **B.—African Population.**

Out-patients are seen at the General Dispensary, where one of the Medical Officers from the Native Hospital attends every morning. There is also a Dispensary at the Railway Workshops, attended by an Assistant Surgeon. Venereal disease clinics are held at the General Dispensary and at the native location of Pumwani. Maternity and child welfare clinics, under the immediate care of the Sisters attached to the Health Office, are held at Pumwani and at the Health Office.

In-patients are received at the Native Hospital, the Infectious Diseases Hospital, and the Mathari Mental Hospital.

The work of the Native Hospital is much hampered by the inadequacy of the accommodation. It has been proposed that the Hospital shall be moved from its present site, since the site is desired for residential purposes and is moreover rather remote from the native quarters of the town. Consequently no new buildings have been erected, and the old buildings are continually overcrowded. To mention one particular disability, there is only one ward for women and children, and maternity cases, which are applying for treatment in increasing numbers, have to be admitted to the same ward as general medical and surgical cases.

As the result of the lack of accommodation patients have had to be refused admission and others have been discharged too early.

The Infectious Diseases Hospital has long been recognised as inadequate for the requirements. This institution receives tuberculous cases and male venereal disease patients, in addition to cases of acute infectious disease. Preparations had been made for the erection of additional permanent wards, but the work has been postponed in view of the possibility of transferring the hospital to the same site as that selected for the new Native Hospital.

The Mathari Mental Hospital requires improvement and enlargement. It is in a continual state of extreme overcrowding, and many cases have to be refused.

## **2.—MOMBASA AND THE COASTAL AREA.**

### **(1) MOMBASA.**

#### **A.—European Population.**

The European Hospital primarily intended for Government Officials remains the only hospital for the general European population. Out-patients are attended here, or at the Native Hospital. There is no European private practitioner in Mombasa.

#### **B.—Native Population.**

The Native Hospital at Mombasa serves the population of the town, and is also the existing general hospital for the greater part of the Coastal Area. The hospital is always full, often overcrowded. In its present situation there is no room for expansion. The out-patient attendance is large. Railway employees in the Kilindini area are attended, as out-patients, at the Kilindini Dispensary. Maternity and child welfare work is carried out by the Health Sisters at the Health Office, and by house to house visiting.

Cases of infectious disease, in all races, are admitted to the Infectious Diseases Hospital at Mizima. The site of this hospital has been suggested as suitable for a future combined general hospital.

A maternity and child welfare centre was opened during the year by Lady Grigg, to be managed by the Lady Grigg Child Welfare League.

### **(2) DIGO DISTRICT.**

The need for medical attention to the population of this District, which extends from the line of the Railway southwards to the Tanganyika border, has long been urged. The Medical Officer now posted to this District has perforce to live in Mombasa, since nowhere else is a house available. Consequently to visit his District he has to cross by the ferry from the Island to the mainland, an unsatisfactory state of affairs when travelling by motor car.

The administrative centre of the District is Kwale, a station pleasantly situated in the Shimba Hills. Here a dispensary has been built by the enterprise of the District Officer; it is suggested that, if Loan Funds are available, the hospital for the District and the house for the Medical Officer shall be built at Kwale. Other dispensaries are being instituted at Tiwi, Gazi, Mazeras and



Mariakani, existing buildings being adapted for this purpose. These can be regularly visited by the Medical Officer. The prevailing diseases are malaria, yaws and ankylostomiasis.

The Coast Technical School, at Waa, is situated in this District. The health of the pupils will be a matter for special investigation by the Medical Officer.

The population of the Digo District has been estimated at about 39,000.

### (3) MALINDI DISTRICT.

The problem in this District is very similar to that in the Digo District; a scattered population, unduly unhealthy, with a heavy incidence of malaria, yaws and ankylostomiasis. The only hospital is at Malindi, which though at present the administrative centre is too remote from the bulk of the population. After repeated attempts to select a suitable site for the medical headquarters of the District, where a hospital and Medical Officer's house might be built, it would seem that Kilifi is the most convenient. The outstanding difficulty is the absence of a permanent and adequate water supply. Until this difficulty has been overcome, no progress can be made. In the meantime it has been possible to accommodate the Medical Officer in a privately owned house near Kilifi Creek, and from this centre he visits the dispensaries which have been established at Kilifi, Kaloleni and Ganzi.

The Medical Officer also makes periodical visits to Malindi, where the work of the small hospital is carried on by a sub-assistant surgeon. There is a most unsatisfactory leper settlement near Malindi.

\* The population of the Malindi District has been estimated at about 67,000.

### (4) TANA AND LAMU DISTRICTS.

In these Districts there is no Medical Officer. There is a small native hospital at Lamu, under the care of a sub-assistant surgeon, but it is inconveniently placed as a medical centre, since the bulk of the native population is along the Tana River, and here also is the greatest incidence of disease.

Towards the end of the year an assistant surgeon was sent up the Tana Valley for the special purpose of carrying out treatment for yaws, while at the same time obtaining information of the prevalence of other diseases. The Tana Valley is extremely unhealthy, and the problem of improving the health of its inhabitants presents great difficulties.

The population of the Tana and Lamu Districts has been estimated at about 31,500.

## 3.—MACHAKOS, KITUI AND TEITA DISTRICTS.

### (1)—MACHAKOS DISTRICT.

At Machakos there is one of the two permanently constructed native hospitals which were built previously to the 1922 financial retrenchment. The number of in-patients has steadily risen in recent years, and the present buildings are insufficient for the patients requiring admission.

During the year a second Medical Officer was posted to Machakos, in order to allow more attention to be given to the development of the system of dispensaries in the District. These, to the number of 12, had been already established, as temporary grass huts. Supervision of the work of the native dressers has been difficult, owing to the lack of motor roads and the impossibility of the single Medical Officer being absent for too long a period from Machakos. Another matter which needed careful consideration was the correct siting of the dispensaries. The Local Native Council had voted funds for the replacement of some of the dispensaries by permanent brick buildings, and it was important that these should be built where they would be most convenient for the population and the Medical Officer. At two selected sites permanent dispensaries and dressers' houses were commenced, the actual work of building having been undertaken by the staff of the Technical School at Machakos, an agreement having been come to with the Education Department by which school and medical buildings should be erected at the same time. It is hoped that eventually all the dispensaries in the District will be thus rebuilt.

Though an efficient hospital, and a system of properly organised dispensaries, must be of material benefit to the native population, yet in the Machakos District, as in the native reserves generally, the great need is for an improvement in native housing, feeding and habits.

There are several missions operating in the District, of which some carry out medical work.

The population of Machakos District is estimated at about 187,000.



## (2)—KITUI DISTRICT.

Representations have been made for a long time past for better medical provision for the needs of this large district, the only Government institution being a small and unsatisfactory hospital at Kitui. Work was begun on the nucleus of a permanent hospital, and by the end of the year two wards and an office-dispensary had been completed. There was, however, no accommodation for a Medical Officer, so that it was not possible, in 1926, to fill the appointment for which provision was made in 1925 Estimates.

Fortunately it appears likely that Loan Funds will be forthcoming, which will allow the hospital to be completed by the addition of the necessary buildings, and a house for the Medical Officer to be erected. When this is accomplished the first step will have been taken towards supplying the native population of the Kitui District with the medical facilities they deserve.

The population of Kitui District is estimated at about 125,000.

## (3)—TEITA DISTRICT.

It is to be regretted that it has not yet been possible to supply a Medical Officer to this District. There is a small and unsatisfactory native hospital at Voi, on the Railway, under the care of a sub-assistant surgeon. It is not, however, in the vicinity of the main line of the railway that the chief population is to be found, but rather in and around the Bura Hills, the nearest point of which is about fifteen miles from Voi. Here there is a comparatively concentrated native population, which would well repay the work of a Medical Officer, since the Wateita are an intelligent tribe and ready to avail themselves of any help which may be offered. So far not even a dispensary has been opened, though it is hoped that this may be accomplished if it prove practicable for the Medical Officer of the Digo District to arrange for occasional visits of inspection. Even with the unsatisfactory state of the existing hospital at Voi an attempt might have been made to post a Medical Officer to the District, but again in this case the lack of a house in which he could live presented an insuperable difficulty.

The Church Missionary Society has two mission stations in the Bura Hills, at which some medical work is undertaken, and there is also a Catholic Mission.

The population of the Teita District is estimated at about 34,000.

**4.—THE KIKUYU RESERVE.**

## (1) FORT HALL DISTRICT.

At the administrative centre, Fort Hall, there has for many years been a native hospital, composed of temporary and most unsatisfactory buildings, under the care of a Medical Officer. It is very doubtful whether Fort Hall should continue to be the medical centre, since the native population is not readily attracted to the Station. Suggestions have been made for the erection of a permanent hospital, when this comes within the region of probability, at a convenient site some distance from Fort Hall and more accessible to the bulk of the population. In the meantime the existing hospital buildings are rapidly falling into a state of decay, and must shortly become uninhabitable.

During 1926 a second Medical Officer was posted to Fort Hall, a mud-brick and grass hut being built for the purpose. This allowed more attention to be given to the system of dispensaries centred in Fort Hall, of which there are eight. With the present class of insufficiently trained and disciplined native dresser it is impossible to expect satisfactory work to be done at these dispensaries, unless visits of inspection are frequent. Even so the efficiency of the dressers and the dispensaries leaves much to be desired. The presence of an assistant Medical Officer also allowed more extended journeys to be made through the District, away from the dispensaries, and closer touch to be maintained with the natives. With the Kikuyu tribe, more perhaps than with other tribes in the Reserves, it is personal acquaintance with the Medical Officer which counts more than anything else in obtaining the confidence of the people. Unless the Medical Officer be known and trusted, attempts to offer medical relief, or to improve insanitary conditions, meet with little response.

The prevailing disease is yaws, but plague, malaria and relapsing fever are endemic; while faulty nutrition and intestinal parasites most probably play a large part in the general unhealthiness of the population.

There are several missions operating in the District, but they maintain no hospitals.

The population of the Fort Hall District has been estimated at about 150,000.



## (2) EMBU DISTRICT.

There was formerly maintained at Chuka a hospital under the charge of a Medical Officer. As mentioned in last year's Report, this hospital was closed, on account of the institution of a Church of Scotland Mission Hospital at Chogoria. During the year the doctor in charge of this mission hospital went on leave, and the arrangement by which he supervised the Government dispensaries in the Embu District terminated. Consequently the supervision of these dispensaries, and the care of the health of the whole District, fell on the medical staff at Fort Hall.

The problem of meeting the medical needs of this District is difficult: staff is not available to post a Medical Officer for this duty alone: moreover when a Medical Officer was stationed at Chuka there was reason to think that the population failed to respond to the opportunity of medical relief so afforded. Certainly a great work was carried out in the treatment of yaws, and the results as regards the incidence of this disease are undoubted. This work has been fully described by Dr. J. C. J. Callanan, the Officer responsible for it; the account was published in the *Kenya Medical Journal*, Volume 3, No. 3, in June, 1926, and a summary of it appeared in the *Transactions of the Royal Society of Tropical Medicine and Hygiene*, Volume XIX, Nos. 5 and 6.

But the people of this District appear to be even more lethargic and indifferent to any attempts at hygienic improvement than other divisions of the Kikuyu tribe, and permanent benefit can only be expected when their present mental and moral habits have been radically reformed.

The population of the Embu District has been estimated at about 83,000.

## (3) SOUTH NYERI DISTRICT.

The administrative centre of this District is Nyeri. Here there is a small hospital, consisting of a collection of primitive and entirely unsuitable buildings, under the charge of a sub-assistant surgeon: many of the patients are labourers from the surrounding European Farms.

The native reserve lies to the south of Nyeri, and for the bulk of the population of the District the hospital at Fort Hall is the only available Government hospital.

It has been proposed that a suitable centre for medical work would be the Government station of Keruguya: within a fifteen mile radius of this station it is said that there is a population of one hundred thousand, which has hitherto had little opportunity of medical assistance. Yaws is rife; plague breaks out from time to time, and may be considered endemic.

The Local Native Council has voted a sum of money for the erection of a hospital at Keruguya: a sum insufficient for building a complete hospital, without provision for staff or upkeep. The question arises whether with the present sanctioned staff of the Department it will be possible to accept the responsibility of maintaining a hospital at Keruguya, while at the same time developing medical services for the Fort Hall District adjacent.

Towards the end of the year a Medical Officer was detached for temporary duty at Keruguya, with the object of exploring the possibilities of medical work in that sub-district, and carrying out treatment of as many yaws cases as could be reached. A small building had been erected by the District Officer, in which a few in-patients could be accommodated, and a grass hut was built for the Medical Officer.

The Church of Scotland Mission maintains a native hospital at Tumu Tumu, which is in the centre of South Nyeri District.

The population of South Nyeri District has been estimated at about 190,000.

## (4) MERU DISTRICT.

For the last two years a Medical Officer has been stationed at Meru. The nucleus of a hospital has been formed by the erection of a timber-built office-dispensary, and a brick-walled ward, to replace the log-huts previously in use. The Medical Officer himself lives in a log-hut, which is in a state of disrepair and is entirely unfit for the accommodation of a married man. It is sincerely to be hoped that housing conditions for all Officers at this Station will be improved in the near future.

Dispensaries have been opened at centres selected as being most convenient for the local population while not too remote from Meru. No dispensaries have been opened in the more remote parts of the District on account of the expense which would be incurred in motor transport by the Medical Officer on visits of inspection. Medical work in the Meru District is yet in its infancy. There is need for an adequate hospital at Meru, and consolidation of the system of dispensaries.



Of missions operating in the District the Methodist Mission is proposing to establish a hospital at Kiagoi, about thirty-nine miles north of Meru. This mission already has a doctor on its staff.

The Medical Officer at Meru is also responsible for the Northern Frontier Posts of Barsaloi, Marsabit and Sankuri. Journeys to these posts can occasionally be made by motor car or lorry, but are usually accomplished by camels.

The population of Meru District has been estimated at about 120,000.

#### (5) KYAMBU DISTRICT.

This District comprises the country to the north and north-west of Nairobi. Previous to the financial retrenchment of 1922 a small native hospital was maintained at Kyambu, the administrative centre fourteen miles from Nairobi. This, however, had to be closed down, and the population of the District has since been dependent on the Native Hospital in Nairobi.

There is no doubt that this large and densely populated District cannot be adequately served by a hospital in Nairobi. Not only is the distance too great, but the natives of the Reserve are generally disinclined to venture into the metropolis. As a first step towards providing more medical assistance for the natives of this District, who on account of their proximity to the settled areas of Kyambu and Thika may be considered of particular importance in the economic development of the Colony, it is proposed to open three dispensaries, at widely separated points. These will be visited by medical officers from the Nairobi Native Hospital. The Local Native Council has voted a sum of money for the establishment of these dispensaries, and is also anxious to procure the erection of a central hospital at Kyambu. There is little doubt that if such a hospital could be provided and maintained it would be in great demand.

The more important diseases of the District may be said to be malaria and plague.

The Church of Scotland Mission Hospital at Kikuyu is situated in this District.

The population of the Kyambu District, exclusive of the settled area, is estimated at 80,000.

### 5.—NYANZA PROVINCE.

#### (1) KISUMU.

##### (a). European Population.

A bungalow, adapted as a hospital and capable of receiving six patients, has continued to serve the needs of the European population of Kisumu, both official and non-official, and of the neighbouring settled areas. The building is not suitable for the purpose: for instance there is no accommodation for housing the Nursing Staff, who live some distance away. Moreover it is the property of the Kenya and Uganda Railway, and a request has been made for its evacuation. Proposals have been made for the erection of a new European hospital out of Loan Funds.

##### (b)—Native Population.

The large and well-equipped native hospital serves not only the town population but also the whole of the Central Kavirondo District. Although the hospital compares favourably with most of the other native hospitals of the Department as regards construction and accommodation, there are two temporary wards which could be replaced by more substantial buildings; and since the hospital is now always overcrowded it certainly requires extension.

During 1926 a second Medical Officer was posted to Kisumu, and the opportunity was thus made for bringing two of the dispensaries of the Central Kavirondo District, those at Nyangori and Nyando, under the supervision of the staff of the hospital, and so relieving the Medical Officer of that District from extra work which was quite beyond his power.

It was also possible during the year to increase the European nursing staff of the Hospital to two; on this being done the women out-patients were separated from the men and the women were thereafter treated by one of the Nursing Sisters. The result has been an increase in the number of women patients and the commencement of a promising maternity and child welfare work. This procedure might be adopted with benefit at other native hospitals, if only staff and housing accommodation allowed.

There continued to be a great number of patients suffering from syphilis attending for treatment at Kisumu Hospital. The reason may be not only that syphilis is particularly prevalent in Central Kavirondo, but also that this hospital has acquired a special reputation for the treatment of venereal disease.



## (2) CENTRAL KAVIRONDO DISTRICT.

During 1926 the Medical Officer, who had previously resided in Kisumu, transferred his headquarters to Maseno, where a house was found on the Maseno Estate, close to the Church Missionary Society hospital and school. As described more fully in another part of this Report ("Major Endemic and Epidemic Diseases—Syphilis") one object of this move was to concentrate on the treatment of venereal disease in the District. Although in the attempt to carry out more intensive treatment of syphilis and yaws at selected centres, the rest of the District was comparatively neglected, yet on the other hand the fact that another Medical Officer was engaged in Sleeping Sickness measures along the Lake Shore for the latter half of the year, and in the course of his journeys treated all cases of general disease, resulted in some of the most inaccessible parts of the District receiving more medical attention than had ever previously been achieved.

At Maseno, in the Central Kavirondo District, is the native hospital which was built by the Church Missionary Society with the help of Red Cross Funds, and is maintained by the Mission. There are also other mission stations in the District, at one of which is a small hospital.

The population of the Central Kavirondo District is estimated at about 317,000.

## (3) NORTH KAVIRONDO DISTRICT.

A second Medical Officer was posted to this District during the year, a vacant house at Kakamega being available for his accommodation. The work of the large native hospital at Kakamega, in conjunction with supervision of the numerous dispensaries, and the responsibility for dealing with outbreaks of plague and otherwise attending to the public health of this very large and populous District, had been far too much for any single officer to undertake. Moreover the station and district afford a good field for training a junior Medical Officer.

It is however impossible to report much progress during the year, and this for two reasons. In the first place, the hospital at Kakamega remains as a collection of temporary buildings, of various types of construction and in varying stages of disrepair. In the second place, so little reliance could be placed on the dispensary dressers that, so far from this branch of the medical work being improved and extended, it was suggested that some of the existing dispensaries should be closed down. This, it was felt, would be an unfortunate step to take, and the remedy was sought in increased supervision of the dressers: their work cannot however be satisfactory, nor the dispensaries in any way efficient, until more thorough discipline and training can be obtained.

The question of erecting a permanent and complete hospital at Kakamega was complicated by the doubt which existed as to the continuance of Kakamega as the administrative headquarters of the District. Following a decision on the future headquarters, it is to be hoped that a beginning will be made with a hospital adequate for the present needs of this important District, and so remove what at present is a serious hindrance to medical work.

There are many Missions operating in the District: at one of these, at Kaimosi, a hospital is maintained.

The population of the North Kavirondo District is estimated at about 313,000.

## (4) SOUTH KAVIRONDO DISTRICT.

The whole of this District, including the hospital at Kisii, remains under the care of one Medical Officer. During the first half of the year the Medical Officer detailed for Sleeping Sickness duty was engaged on the Lake Shore of South Kavirondo, but this was little assistance towards general medical work.

The hospital at Kisii is the second of the permanent hospitals erected in 1921. During 1925 the accommodation proved insufficient for the increasing number of patients, and the proposal to construct an additional ward was approved. Although this work was well advanced during 1926 it was unfortunately delayed towards the final stages, and the ward was not available for use by the end of the year.

The hospital at Kisii is an important centre for the treatment of all kinds of disease, and a large amount of surgical work is undertaken. But greater attention to the hospital has resulted in less time being available for general medical work in the District, and for supervision of the scattered dispensaries. There is a wide field of work which is not yet being developed. The incidence of yaws and syphilis is high in certain areas; a great proportion of the population of the Lake Shore is infected with malaria; plague continually appears in many locations.



Of the Missions operating in South Kavirondo, the Seventh Day Adventist Mission has recently built a hospital at Kendu Bay, where a doctor is in residence.

The population of South Kavirondo is estimated at about 301,000.

#### (5). LUMBWA DISTRICT.

There is a District Surgeon at Kericho; his duties include the supervision of a dispensary and small hospital where a native dresser is in charge. This is the only medical service for the Lumbwa Reserve.

The population of the Lumbwa District is estimated at 64,000.

#### (6). NANDI DISTRICT.

At Kapsabet, the administrative centre of the District, there is a small hospital, of mud-walled, grass-roofed huts, in the charge of a Sub-Assistant Surgeon. The District is included, as regards medical work, with North Kavirondo, and comes under the supervision of the Medical Officer at Kakamega.

The population of the Nandi District is estimated at about 38,000.

### 6. MASAI RESERVE.

Provision was made in 1925. Estimates for the restoration of a Medical Officer to this Reserve, and one was maintained there throughout 1926.

The problem of meeting the medical needs of the Masai is not easy: forty thousand nomads wandering over eighteen thousand square miles of roadless country can scarcely be attended to by one Medical Officer, nor served by one hospital. However, the number of patients attending for treatment at the collection of dilapidated huts which comprise the hospital at Narok is sufficient to justify the erection of a permanent hospital at this centre. Beyond undertaking such in-patient treatment as is possible at Narok, the Medical Officer makes occasional journeys through the Reserve, treating minor ailments, and carrying or persuading serious cases to hospital.

There is a proposal to establish permanent dispensaries at several selected spots; but the number of these will be determined by the funds available for motor transport of the medical officer on visits of inspection, without which the utility of the dispensaries is likely to be small.

A dispensary has been established, for the benefit of the Masai in the Southern portion of the Reserve, at Kajiado on the Magadi Railway. The native dresser in charge is supervised by the administrative officers.

The population of the Masai Reserve is estimated at about 48,000.

### 7. KERIO PROVINCE.

This includes the Districts of Ravine, Baringo, Elgeyo, Marakwet, and West Suk. During 1926, it was found possible to post again a Sub-Assistant Surgeon to Kacheliba, the administrative station in the extreme north-west of the Province. Apart from the hospital treatment which is possible at this station, in the temporary erection which does duty as a hospital, the only other medical services for the Province are provided by imperfectly trained native dressers at Ravine, Kabarnet, Tambach and Marakwet, who work under the supervision only of the district officers.

From time to time reports of out-breaks of disease are received from various parts of the Province; thus during 1925 and the early part of 1926 there were reports of much sickness and a high mortality among the Kamasai and neighbouring tribes. In the absence of first-hand information of the features of such out-breaks, it is impossible to define their nature.

The need for more medical attention is undoubted, but how to meet it is a difficult question to answer. The population is sparse, and a suitable station for a medical officer, were one available, or for a central hospital, would be hard to choose, considering that the Province consists of twenty-six thousand square miles of very difficult country. To propose several small hospitals, for the various Districts, raises at once the difficulty of multiplication of staff. In the case of Elgeyo, the Local Native Council was anxious to vote funds towards the construction of a hospital; but since the amount available was by no means sufficient for the building alone, without considering the cost of staff and upkeep, the offer unfortunately could not be accepted.

The population of the Kerio Province is estimated at about 119,000.

### 8. TURKANA.

During the year a Medical Officer was sent to Turkana, in place of the assistant surgeon who had previously been in charge. This change was made on



account of the unenviable reputation of the district, the invaliding rate for military officers stationed there having always been very high. Medical work amongst the natives is only in its earliest stages, but there is reason to believe that opportunities could be found for development. Unfortunately hospital facilities are practically non-existent, and with the present system of transport it is seldom possible for the Medical Officer to move from his station.

The population of Turkana is estimated at about 40,000.

## 9. NORTHERN FRONTIER DISTRICT.

The Medical Officer has his headquarters at the frontier post of Moyale, where there is a small hospital. The patients treated at the hospital include many Abyssinians. The Medical Officer endeavours to visit the other posts of Wajir and Mandera, but there has been difficulty, during the transfer from military to civil administration, over the question of armed escort, without which it is unsafe to travel.

A sub-Assistant Surgeon is stationed at Mandera.

The cession of Jubaland to Italy has altered the distribution of forces in the District, and in consequence of the increased strength of the garrison at Wajir it was intended to move the Sub-Assistant Surgeon to that post. Representations of the frequency of casualties at Mandera, and the greater inaccessibility of this place, caused the proposal to be abandoned.

The construction of roads passable for motor transport has opened up the Northern Frontier District to a remarkable extent, and communication is now greatly accelerated: but adequate medical attention for the widely separated posts still remains a difficult problem. Medical work among the various tribes is practically negligible.

The population of the Northern Frontier District is estimated at about 90,000.

## 10. THE SETTLED AREAS.

It has not hitherto been the policy to provide an organised system of medical services for the settled areas of the Colony, except in so far as Government servants are concerned. The general European population is dependent on private practitioners, or may obtain the assistance of such Government Medical Officers as happen to be accessible. For medical attendance on natives in European employ the employer is held responsible, in accordance with the terms of the Employment of Natives Ordinance.

During 1926 a Local Government Commission was engaged in carrying out investigation into the question of public services for the settled areas: it is expected that the recommendations of this Commission will include proposals for some organization of medical services.

### (a)—EUROPEAN POPULATION.

Although Government has not accepted responsibility for providing hospital facilities for the general European population, non-official patients have always been admitted to the Government hospitals at Nairobi, Mombasa, and Kisumu. Besides these three hospitals, there was previously a Government European Hospital at Eldoret; for the sake of economy this hospital was handed over to the care of a local board of management, and has been maintained by the local community, independently of Government, ever since.

At Nakuru there is a War Memorial Hospital, which was built by local voluntary contribution, Government assisting to the extent of £1 for every £2 raised locally and by an annual grant for the first two or three years towards the cost of maintenance. At Kitalé there is a small nursing home.

District Surgeons are maintained by Government at Nakuru, Eldoret and Kericho; these are local medical practitioners receiving a part-time salary, in return for medical attendance on Government servants and supervision of other medical work of the station and district which ordinarily would be carried out by a Government medical officer.

One other form of assistance by Government, towards providing medical attention for the European population of the settled areas, is the system of "Soldier Settler Medical Farms." This system was inaugurated in 1919 as part of the Soldier Settler Scheme. Certain farms were earmarked for allotment to qualified medical practitioners in districts where no other medical help was available. Since the beginning of the scheme 11 such farms have been taken up: of these 9 are still occupied. The conditions of free grant of the farm require residence and the performance of the duties of a general medical practitioner within a circle of twelve miles radius for a period of years. The period of



residence was fixed originally at three years out of the first five years following allotment. In 1925 the period was altered to seven years out of ten, in the case of new allotments. During 1926, two new farms were occupied.

#### (b)—NATIVE POPULATION.

Government native hospitals are maintained at three stations in the settled areas, viz. Nakuru, Eldoret and Nyeri, where a Sub-Assistant Surgeon is in immediate control, under the supervision of the District Surgeon. These hospitals were not originally instituted for natives in private employ, but most of the patients are now of that class. In addition other Government hospitals are within reach of parts of the settled areas, e.g., Nairobi, Machakos, Fort Hall, and Kisumu. All native out-patients, whether privately employed or not, are treated free at these hospitals: for inpatients in private employ a charge of one shilling a day is made to the employer.

At Kitale, the centre of the Trans-Nzoia District, the local community has undertaken the erection of a small native hospital, which it is hoped will be maintained by local effort, with such assistance from the Medical Department as may be necessary and possible.

As previously mentioned in this Report, during 1926, a Senior Medical Officer was appointed specifically for the purpose of investigating and advising on the health of native labour.

### 11. KENYA AND UGANDA RAILWAY.

Medical services for the Kenya and Uganda Railway are still the responsibility of the Medical Department. The services rendered include the following:—

- (1) In-patient treatment at the Government hospitals at various stations, viz. Mombasa, Voi, Nairobi, Nakuru, Kisumu, Fort Hall, and Eldoret.
- (2) Out-patient treatment at these hospitals, as also at special dispensaries at Kilindini and the Railway Workshops at Nairobi.
- (3) Visiting, by members of the departmental staff, of railway officials in their quarters, whether in the larger towns or at the smaller stations along the line.

In return for these services the Railway pays an annual per capita contribution to Government, calculated on the number of persons in Railway employment, Europeans, Asiatics and Africans.

During the whole of 1926 a Medical Officer was seconded from the Department for supervision of the staff and labour employed on Railway construction. The salary of this officer was borne by the Medical Department.

## IV.-MAJOR ENDEMIC AND EPIDEMIC DISEASES.

### 1.—YAWS.

The total number of cases recorded as treated in hospitals, at dispensaries, or by Medical Officers on tour, was 66,883.

The numbers of cases recorded for the last five years are:—

1922	...	...	...	...	24,233.
1923	...	...	...	...	64,344.
1924	...	...	...	...	45,527.
1925	...	...	...	...	50,584.
1926	...	...	...	...	66,883.

The treatment adopted, in the very great majority of cases, is intramuscular injection of a soluble bismuth salt, the injection being repeated as often as the patient can be induced to attend, until seven or eight injections have been given. This total is very seldom attained: it is probable that the greater number of patients only received one injection. Careful records are kept in each district of the number of attendances for treatment, the method employed being to issue to each new patient a numbered metal badge, subsequent re-attendances being noted against that number in the register. The use of metal discs, instead of paper tickets, was introduced in South Kavirondo in 1924, as was mentioned in the Annual Report for that year; it was later extended to all districts where yaws treatment is undertaken, since it provides a permanent identification badge. If any proportion of these badges are retained by the holders over a period of years, it should prove possible eventually to estimate the value of the wholesale treatment which has been carried out during the last few years.

It would seem that the general effect of the campaign has been a reduced incidence of yaws. Certainly many thousands of cases have been rendered non-infective, at least temporarily. How many cases will relapse cannot be foretold.



Only in Nairobi has systematic continuous treatment, with continuous examination of serum-reaction, been possible. In Nairobi at the Infectious Diseases Hospital, protracted treatment of a large number of yaws patients was undertaken, and repeated tests made of the Wassermann and Sigma reactions. The results, when tabulated, should give the first definite and reliable indication of the value of bismuth treatment.

As was mentioned in last year's Report, the bismuth salt used for injections is no longer prepared at the Medical Laboratory. The remainder of the accumulated stock was exhausted in 1926 and thereafter two salts, obtained from firms in England, were in use, viz. sodium potassium bismutho tartrate, and sodium bismuth tartrate, only a small amount of the former was employed.

Neither of these salts appears to have proved so uniformly satisfactory as the double salt previously prepared locally, and toxic effects have not been unknown. It may be that the use of a suspension of metallic bismuth will prove possible and preferable, and experiments are now being conducted with the view to determining the comparative advantage of bismuth in an insoluble form.

It may here be mentioned that for years past the prevalence of yaws in the population of the Tana Valley has been represented as calling for special consideration and action. Towards the end of 1926 it was possible to detail an Assistant Surgeon for a special yaws campaign along the length of the Tana River. With the Assistant Surgeon were six African Dressers, who had been enlisted and trained particularly for giving intramuscular injections of bismuth. From reports already received it is probable that this special mission will greatly reduce the number of infective cases of yaws in the Tana Valley.

## II.—SYPHILIS.

As far as can be judged syphilis continues to be chiefly a disease of the large towns and of the Central and South Kavirondo Districts. The freedom of the Kikuyu is still remarkable.

The total number of cases treated during the year shows an increase of 2,637 over that of 1925.

The figures for the past five years are as follows:—

1922	...	...	...	...	2,896
1923	...	...	...	...	6,532
1924	...	...	...	...	11,492
1925	...	...	...	...	13,581
1926	...	...	...	...	16,218

An attempt was made during the year to tackle the problem of syphilis in the Central Kavirondo District in a more satisfactory way than had been done in the past. The previous practice had been for the Medical Officer, with his headquarters at Kisumu, to make almost continuous journeys throughout the District, staying for two or three days at each of the district dispensaries, nine in number, for the purpose of treating such patients as attended. By this method each dispensary was visited at intervals of one to two months, and at each visit a large number of cases of syphilis and yaws received a single injection of bismuth or, exceptionally, Novarsenobillon. Though by this method a very great number of patients came under observation, in all parts of the District, there was no provision for continuous treatment of any individual patient: he might, or might not, return at monthly or longer intervals for further injections. It was therefore arranged that the Medical Officer should make his headquarters at Maseno, and from that centre make weekly visits to four selected dispensaries, the visit to each dispensary being made on the same day each week, so that there should be less excuse for patients to miss their treatment. At the same time, since there had been a popular demand for treatment by Novarsenobillon, it was arranged that this treatment should be given on payment, at the rate of ten shillings for a course of six injections, the difference between the payment and the cost of the drug being made good by a vote from the Local Native Council.

It cannot be said that this method has proved very profitable. Taking the period between June 1st and October 31st—the period during which weekly visits were made—the number of cases of syphilis which received treatment at the four dispensaries was 2,381, an average of about 53 per visit. During this period there were also treated at these dispensaries 1,132 cases of yaws, making a total of 3,513, i.e. about 78 injections in all per visit. The number of re-attendances, for both syphilis and yaws, was only 983, or about 22 per visit. That is to say, for every 100 patients who attended for injection only 22 were re-attendances.

The average distance of the dispensaries from Maseno is 26 miles: therefore for every 53 injections for syphilis the Medical Officer travelled 52 miles an expenditure of time and money which may be regarded as disproportionately heavy for the results obtained, especially in view of the corresponding neglect of other parts of the District which was an inevitable consequence.



In spite of the rather unsatisfactory position which obtains in Kavirondo, where probably syphilis is a more pressing problem than elsewhere, there is undoubtedly a growth of public opinion with regard to the disease. The Local Native Council, in addition to making provision as detailed above for treatment by N.A.B. at reduced rates, passed a set of rules under the Native Council Ordinance to make treatment compulsory. Unfortunately the rules were adjudged to be ultra vires on account of the provision already existing in the Public Health Ordinance. It is likely that legislation evolved locally on this particular subject would be more effectual and better regarded than that to a similar end imposed from a distance involving moreover the machinery of an European magistrate and a Court conducted under an alien procedure rather than a less formal trial approximating to native customs.

In Nairobi two venereal disease clinics, started last year, have been in operation. The numbers of patients attending is increasing. The usual difficulty with regard to regular and continued attendance is experienced. Accommodation is provided at the Infectious Diseases Hospital for such male cases as can be persuaded to go. A large mass of information is being obtained as to the effects of treatment with bismuth without the exhibition of other drugs.

### III.—LEPROSY.

The conditions under which lepers can be treated still remain very unsatisfactory. A sum of £1,000 had been allocated as Extraordinary Expenditure on a Leper Settlement for the Coastal Area, but it proved impossible to establish the Settlement on account of the difficulty in selecting a suitable site.

The necessary conditions for the site are permanent water supply, soil suitable for cultivation, and accessibility to a Medical Officer. It is the first of these that has proved the principal obstacle. Repeated search was made in the Malindi District, where it is hoped to retain a Medical Officer, but until further sources of fresh water have been discovered the prospect in that District is not hopeful. It was hoped that a suitable area of land on the shores of Port Reitz, a few miles from Mombasa, might be acquired, but local opposition to the establishment of the Leper Settlement so close to Mombasa could not be disregarded. It would seem that a site will have to be found either in the Digo District, to the south of Mombasa, or somewhere in the neighbourhood of the railway.

In the meantime the entirely unsatisfactory settlements at Malindi and Lamu remain the only existing accommodation for the lepers of the Coastal Area, with the exception of the few that are under treatment at the Infectious Diseases Hospital at Mombasa itself.

With regard to parts of the Colony other than the Coast, lepers are admitted to the Infectious Diseases Hospital at Nairobi, and to camps in connexion with the Native Hospitals at Kakamega and Kisii. At Nairobi the results of treatment have been satisfactory, and some of the patients are so far cured as to be non-infective, and are employed as part of the hospital menial staff. The number of lepers at Kakamega has been reduced by discharge of some old non-infective cases.

The total number of cases treated during 1926 was 483 of which 240 remained from the previous year.

Without suitable accommodation where treatment can be obtained and the growth among the population of a desire for treatment, no accurate estimate of the incidence of leprosy can be made but there is no reason to vary the previously expressed opinion that the disease is of minor importance as an economic factor.

With the help of the British Empire Leprosy Relief Association a supply of seeds of *Hydnocarpus Wightiana* was obtained, and the Forestry Department has made attempts at growing the trees. It is understood that the attempts have not been very successful, and it appears unlikely that the climate of Kenya will prove favourable for cultivation of this tree.

The method of treatment by intravenous injection of chaulmoogra oil which was described in last year's Report has not been continued on account of the severe reaction produced.

### IV.—TUBERCULOSIS.

The menace of tuberculosis remains vague but formidable. The recorded figures for the last three years are as under:—

				Cases.	Deaths.
1924	...	...	...	528	72
1925	...	...	...	435	84
1926	...	...	...	453	56

Recorded figures of cases diagnosed as tuberculosis in Government hospitals, or of deaths certified as due to tuberculosis, give no reliable indication of the incidence of the disease throughout the Colony.



Tuberculous subjects in the native population of the large towns are likely to come under medical observation during the advanced stages of the disease, and do so in numbers which are disquieting: since under existing conditions of native housing it seems inevitable that every infectious case must give rise to many others. Tuberculous subjects in the Native Reserves may or may not be detected. Since many have been detected during the last few years, and since each year there is more and more opportunity for the natives of the Reserves to come under medical observation, it is perhaps remarkable that the recorded number of cases has not risen more rapidly. Conditions of life in the Native Reserves would seem to afford every chance for spread of infection: native housing and native habits would appear to be most favourable to the diffusion of the tubercle bacillus. Moreover it is generally assumed that the African offers very little resistance to bacillary invasion.

Many Medical Officers believe the incidence of tuberculosis to be high, and to be increasing in the Reserves; but the fact cannot be proved by figures, and under the circumstances this is rather surprising.

Whatever the future may reveal, it is quite certain that more facilities, than are at present available, are required for the accommodation and treatment of infectious cases. In Nairobi, tuberculous cases are received at the Infectious Diseases Hospital, where extension or improvement of existing accommodation is delayed by uncertainty as to the permanent site of the institution. In Mombasa there is special provision at the Infectious Diseases Hospital for tuberculous cases. But in the Reserves there is no provision other than the wards of the Native Hospitals: one of the most urgent needs of these hospitals is the erection of sufficient wards of permanent construction to enable infectious tuberculous patients to be properly protected. The temporary buildings, often of mud walls, earth floors and grass roofs, of which many hospitals consist, are the worst type possible for tuberculosis wards.

The cases which come under observation are as varied as those found in England. Tuberculosis of glands, joints and bones are reported from all stations. Examination of meat and veterinary examination prove that the disease is present among cattle though the extent is not known.

## **V.—PLAGUE.**

### **1.—INCIDENCE OF THE DISEASE.**

#### **NYANZA PROVINCE.**

Plague is endemic in the three Kavirondo Districts of the Nyanza Province and during 1926 sporadic cases or small outbreaks were reported from each of these districts. In no case, however, did any serious epidemic occur. On the whole, the incidence of the disease was probably considerably less than in previous years. In the township of Kisumu a localised outbreak occurred but only four cases resulted.

#### **UKAMBA AND KIKUYU PROVINCES.**

##### **Nairobi Municipal Area (Ukamba Province).**

During the last five months of the year 43 cases of plague occurred in the township resulting in 32 deaths. The incidence of the disease was almost entirely confined to the more congested areas in the centre of the town and to those more outlying parts in which more or less dilapidated wattle and mud or wood and iron buildings are still to be found. In the better class residential areas no cases occurred. It is satisfactory to record that this outbreak of plague excited much more attention on the part of the local authorities and the public than has been the case on previous occasions and it would appear that there is an increasing appreciation of the fact that plague is a reliable indicator of insanitary conditions. As a result of the outbreak it would appear probable that steps will shortly be taken by the Municipal Council to ensure that no further buildings of a nature likely to give undue harbourage to rats will be constructed in the centre of the town.

##### **Voi District (Ukamba Province).**

A small outbreak of a disease which was probably plague was reported from the Teita Hills. Circumstances did not allow of an investigation of this outbreak being affected.

##### **Kyambu District (Kikuyu Province).**

Plague occurred in sporadic form in various farms and locations throughout the district but no epidemic occurred.

##### **Fort Hall District (Kikuyu Province).**

Only a few small outbreaks of plague were reported from the Fort Hall district during 1926, in contradistinction to the very high incidence of the disease which occurred during the previous year.



**North Nyeri District (Kikuyu Province).**

A small outbreak involving six cases occurred on a coffee estate in the North Nyeri district in February. This would appear to be the first occasion on which plague has been definitely recorded in this district.

**Nakuru District (Extra-provincial District).**

Ten cases of plague were reported from this district in December.

**Trans Nzoia District (extra-provincial District).**

Five cases of plague were reported from farms in the South Western corner of this district in December. The infected area marches with the North Kavirondo native reserve in which the disease is endemic.

**SEYIDI (COAST) PROVINCE.**

No cases occurred.

**2.—ANTI-PLAGUE MEASURES.****(a). Methods adopted in Townships.**

Rat destruction was continued as usual in the larger townships of Nairobi, Mombasa and Kisumu. The numbers of rats destroyed in these towns were as follows :—

				1924.	1925.	1926.
Kisumu.	...	...	...	5,591	4,087	10,255
Nairobi.	...	...	...	17,738	19,908	46,827
Mombasa.	...	...	...	10,957	19,291	40,014

**(b). Methods adopted in Native Reserves.**

The rat destruction campaign continued to be carried out in the North and Central Kavirondo Native Reserves. The totals for the year are given in the attached tables.

**(c). Inoculation with Anti-Plague Vaccine.**

97,800 doses of anti-plague vaccine were manufactured at the Laboratory in Nairobi during the year for use in various parts of the country.



## RAT DESTRUCTION RETURN: NORTH KAVIRONDO AND NANDI RESERVES, 1926.

Location.	Chief.	Huts.	Jan. Feb. April, May. and March. and June.					Sept.	Oct.	Nov.	Dec.	TOTAL.
			Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.
Wanga.	...	8,102	...	—	—	17,305	—	1,898	—	—	—	1,898
Marama.	...	8,112	...	10,035	1,338	17,305	4,137	2,063	25,721	4,360	2,734	67,693
Kisa	...	1,518	...	2,286	941	—	—	14,210	483	—	—	17,920
Bunyore.	...	9,518	...	24,958	32,819	34,261	25,862	37,496	33,436	32,451	16,114	237,397
E. Kakamega.	...	2,966	...	11,650	12,555	4,468	3,630	2,827	2,531	5,175	—	42,836
W. Kakamega.	...	5,636	...	62,203	33,341	4,750	—	19,230	13,356	9,980	53,470	196,330
Watotsotso.	...	1,900	...	13,985	15,924	4,000	2,730	1,630	1,450	1,250	2,170	43,139
Mululu.	...	1,783	...	5,310	5,570	1,200	—	1,000	1,100	1,300	1,020	16,500
Kakalelwa.	...	1,741	...	2,163	4,812	2,280	2,010	—	—	—	1,508	12,773
Kabaras.	...	2,738	...	2,360	—	—	3,688	2,830	3,166	1,267	—	13,311
N. Kitosh.	...	9,332	...	—	7,290	3,740	—	1,650	4,810	3,410	1,300	22,200
S. Kitosh.	...	6,965	...	—	11,904	17,996	8,860	7,483	1,008	2,985	—	50,236
Wamia.	...	6,597	...	9,206	6,880	6,073	—	7,870	—	—	—	30,029
Maraach.	...	4,179	...	2,800	—	2,613	1,260	1,240	—	—	2,604	10,517
Ohayo.	...	4,931	...	3,400	8,421	6,763	—	3,951	4,443	6,956	2,888	36,822
Waholo.	...	2,414	...	5,278	4,805	1,117	2,190	4,375	—	2,369	—	20,134
Tiriki.	...	4,855	...	3,500	12,908	4,800	12,905	6,600	—	4,318	—	45,031
Woodidaho	...	9,371	...	60,092	42,475	22,824	13,241	7,670	20,482	13,369	104,045	284,198
N. Maragoli.	...	6,287	...	36,690	6,874	5,360	—	5,350	11,860	8,967	—	75,101
S. Maragoli.	...	—	...	459	550	122	134	105	256	153	108	1,887
Kakamega.	...	98,945	...	256,375	209,407	139,672	80,647	129,478	124,102	98,310	187,941	1,225,952



## RAT DESTRUCTION RETURN: CENTRAL KAVIRONDO DISTRICT, 1926.

Location.	Chief.	Huts.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	TOTAL.	
			Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number of Rats.	Number per hut.	
Samia.	Kadima.	12,692	24,000	—	8,100	5,150	—	—	—	16,400	25,180	—	11,050	10,300	100,180	8.0
N. Ugenya.	Nganda.	8,783	7,950	3,760	2,850	4,391	—	15,330	—	—	—	—	—	—	34,281	3.9
S. Ugenya.	Ndonji.	2,276	1,380	1,460	2,030	4,710	6,290	4,113	3,844	1,640	1,120	1,240	3,200	1,330	32,357	14.2
N. Gem.	Ogada.	8,628	700	1,490	5,660	—	910	910	15,260	770	—	—	—	—	25,700	2.9
S. Gem.	Ndeda.	6,199	—	—	1,260	1,900	—	—	—	—	4,260	1,640	3,090	3,300	15,450	2.4
Alego.	Ngongo.	16,158	—	—	4,130	—	—	2,300	3,760	—	—	—	—	—	10,190	0.6
Sakwa.	Olulo.	4,981	—	670	180	—	—	—	—	—	372	455	—	—	1,677	0.3
Uyoma.	Nathan.	4,294	—	450	1,050	1,450	—	—	—	—	—	—	—	—	2,950	0.6
Asembo.	Odindo.	5,407	1,010	1,100	1,350	400	960	—	3,050	459	920	—	—	400	9,649	1.7
Nyangori.	Chewya.	2,232	11,140	2,900	6,800	—	—	4,000	24,230	—	—	8,600	5,600	—	63,270	28.3
Sagam.	Orao.	1,829	—	2,740	—	3,493	—	1,220	—	3,500	—	—	—	—	10,953	6.0
E. Kano.	Owili.	9,032	—	—	960	—	—	—	—	—	—	—	—	—	960	0.1
Kajulu.	Awuor.	—	—	—	—	—	—	750	—	—	—	—	—	—	750	—
Kadimu.	Okello.	2,201	—	—	—	—	—	—	16,600	—	—	—	—	—	16,600	7.5
Kisumu.	Ouko.	5,643	—	—	—	—	—	—	9,500	—	15,000	1,350	1,908	—	27,758	4.9
Nyakatch.	Mere.	7,741	—	—	—	—	—	—	2,100	—	—	—	—	—	2,100	0.2
S. Teriki.	Chewya.	2,232	—	—	—	—	—	—	—	9,655	—	—	—	—	9,655	4.3
Seme.	Nyawara.	10,145	—	—	—	4,440	—	—	—	—	—	—	—	1,500	5,940	0.5
		110,473	46,180	14,570	34,370	25,934	8,160	28,623	78,344	32,424	46,852	13,285	24,848	16,830	370,420	—



## VI.—SMALLPOX.

Only four cases of smallpox were reported during 1926 in contradistinction to 239 cases in the previous year.

### Vaccination.

During the year routine vaccination has been carried out as usual in connection with prisoners, police recruits, labour recruits, immigrants, etc. A certain amount of vaccination of infants and children has been carried out at the welfare centres established in connection with the Health Offices in Nairobi and Mombasa, but in the absence of a notification of births ordinance the proportion of infants vaccinated is small.

The Mobile Vaccination Team which was established in 1925 has remained in commission throughout the year and from January till September was engaged in vaccinating the Akamba of the Machakos District. During these months 152,443 persons or 84.8 per cent. of the total population of the district were vaccinated. In October the team was transferred to the Kitui district and during November and December over 22,000 of the Kitui Akamba were also vaccinated. It is hoped to complete the vaccination of the Kitui Akamba during 1927.

The total number of vaccinations performed during 1926 was 215,422. The lymph used was prepared at the Laboratory in Nairobi and as usual proved highly satisfactory. Further details with regard to the preparation of the lymph and the results secured are given in the Report of the Laboratory.

## VII.—CEREBRO-SPINAL FEVER.

Thirty seven cases with 22 deaths were reported from eight stations during the year. In 1925 there were 30 cases with 22 deaths.

On only three occasions were meningococci identified at the Laboratory from material from seven suspected cases. It is likely that confusion may on occasion have occurred in cases of malaria presenting symptoms suggestive of posterior basal meningitis.

## VIII.—ANTHRAX.

Only 45 cases were returned as coming under observation in 1926 as against 123 in the preceding year. The figures are almost certainly no indication of the incidence of the disease throughout the country. The fact that meat is a luxury and that the death from disease of a beast is regarded as a misfortune mitigated by an addition to the menu will ensure that cases of anthrax present themselves with regularity.

## IX.—INFLUENZA.

A total of 5,390 cases was returned during the year with only 6 deaths.

## X.—PNEUMONIA.

As before, pneumonia heads the list of recorded causes of death. The figures are as follows.

Mombasa :	150	= 20% of total number of deaths.
Kisumu : Broncho pneumonia	28)	
Pneumonia.	30)	= 30% of total number of deaths.
Nairobi :	171	= 26% of total number of deaths.

The total number of cases treated in the Government Hospitals shows an increase of 290 over that of the previous year, the figures being 1,265 as against 975. There can be little doubt that the malaria epidemic, though directly productive of a comparatively few deaths, made its effect felt in increased morbidity from other diseases notably pneumonia. At the Nairobi Gaol the monthly incidence of disease showed that an increase in cases of malaria was accompanied by an increase in cases of pneumonia.

## XI.—THE ENTERIC GROUP.

A small increase in the number of cases belonging to the enteric group was reported from Government Hospitals during the year. The figures were 56 as against 40 during 1925.

In Nairobi 28 cases were notified to the Medical Officer of Health.



At the Laboratory the results of agglutination tests show positive reactions as follows:—

B. Typhosus	...	...	...	35 cases.
B. Paratyphosus A.	...	...	...	6 cases.
B. Paratyphosus B.	...	...	...	2 cases.

The discrepancy between the Laboratory and the Hospital returns arises from the fact that cases seen by private practitioners do not appear in the Hospital returns while serological reactions from all sources are performed at the Laboratory.

In all seven deaths occurred.

The European population provided eight only of the total number of cases. Twenty-nine native cases were returned from the Native Hospital, Nairobi.

A small outbreak of paratyphoid A was identified on an estate not far from Kisumu. Ten cases occurred among 50 labourers accommodated in a camp of 16 huts.

## XII.—TYPHUS.

No cases were reported as coming under observation at Government Hospitals. Two cases were notified to the Medical Officer of Health, Nairobi.

## XIII.—DYSENTERY.

The total number of cases was slightly less than in the preceding year, the actual figures being 995 as against 1,091 with 65 and 56 deaths respectively.

The comparative rarity of dysentery, at any rate dysentery bad enough to cause the sufferer to seek admission to hospital, as a symptom of amoebiasis, was commented on in last year's Report. The experience of 1926 has not been dissimilar. No cases of amoebic dysentery were reported from the European hospitals while from the large native hospitals at Mombasa and Nairobi, the numbers returned were only 2 and 3 respectively.

Reference to the Laboratory section of the Report will show that the causative organism in the majority of cases of dysentery is not identifiable as belonging to the recognised types.

No epidemic of dysentery was reported during the year.

## XIV.—UNDULANT FEVER.

Only three cases of undulant fever were reported during the year from the various hospitals, two from Nairobi and one from Voi.

The Laboratory returns show positive reactions as follows:—

B. Melitensis	)	...	...	...	4 cases.
B. Abortus	)	...			
B. Paramelitensis		...	...	...	1 case.

## XV.—MALARIA.

The outstanding feature of the year with regard to the incidence of disease has been the epidemic of malaria which occurred during the months of April, May, June and July. This epidemic was more alarming in extent and more serious in its consequences than any which had hitherto been recorded in the Colony. The total number of cases returned as having received treatment at Government Hospitals and dispensaries in 1926 totalled 42,972 as against 23,250 in 1925. In addition to these, very large numbers were treated by private practitioners while many thousands of natives must have received treatment from their employers on farms and estates.

In all those parts of the country which were affected and with regard to which it was possible to make any observations the epidemic would appear to have been associated with a phenomenal increase in the numbers of *Anopheles Costalis*. This increase was both relative and absolute but at the date of writing it is impossible to correlate it with any unusual climatic or environmental variation. One point, however, should be emphasized. *Anopheles Costalis* more than any other anopheline mosquito in Kenya finds in "man-made" breeding places facilities for reproduction and to a very large extent confines itself to breeding places which come within that category. In and around the towns of Kenya the number of natural breeding places suitable for *Anopheles Costalis* is not large. On the other hand the number of artificial breeding places such as borrow-pits, and other excavations, ill-graded earth drains, etc., etc., is very large indeed; it may therefore be said with some degree of probability that the incidence of malaria



in the towns during 1926 was markedly higher than it would have been had development been more carefully controlled. To some extent a similar statement might be made with regard to the rural parts of the settled areas, but to what extent it might hold true with regard to the native reserves it is impossible to say. That there have been no notable general alterations in the domestic environment of the natives of these reserves during recent years is true, but on the other hand it is to be remembered that in every direction roads and, to a less extent, railways, have been carried into and through these areas, and always where there are roads, artificial and undrained excavations are to be found. It is not impossible therefore that the distribution of *Anopheles Costalis* in Kenya is now much wider than was previously the case.

Whatever light may at a later date be thrown upon the epidemiology of malaria in Kenya by future research, one fact would, however, appear to stand out clearly as the result of the experience of 1926, viz., that since it has now been shewn that *Anopheles Costalis* may in Kenya be responsible for epidemic malaria, the possibility of malaria affecting development in any part of the country is not one which can be ignored: it is therefore of prime importance in the interests of development that artificial breeding places should not be established.

#### Preventive Measures.

A large amount of attention was given during the year by the Entomologist to the investigation of the condition of the various towns as regards anopheline breeding, and recommendations were submitted and such steps as were possible have been taken to control breeding by means of oiling, filling in excavations and draining. As a result of the epidemic the importance of taking adequate steps to secure the permanent elimination of breeding places has been more fully appreciated by Local Authorities and by Government Departments than was formerly the case. A comprehensive memorandum on the conditions which in Nairobi are favourable to the propagation of malaria and on the preventive measures which should be taken was submitted to the Council of the Corporation by the Medical Officer of Health and to a number of his recommendations effect has already been given. Other recommendations made by the Medical Officer of Health dealt with major engineering matters and to these full and careful consideration has been given by the Greater Nairobi Town-planning Authority. It is understood that in its Report the Authority will make definite recommendations with regard to the means by which effect may be given to the proposals.

#### XVI.—BLACKWATER FEVER.

The large increase of malaria during the year was not accompanied by a corresponding increase in the number of cases of blackwater.

The figures for the past five years are as follows:—

				Cases.	Deaths.
1922.	...	...	...	39	10
1923.	...	...	...	27	6
1924.	...	...	...	20	9
1925.	...	...	...	50	11
1926.	...	...	...	52	16

Eighteen cases with six deaths occurred among Europeans.

#### XVII.—TRYPANOSOMIASIS.

The International Commission on sleeping sickness was at work throughout the year, with its headquarters at Entebbe, Uganda.

In March, Professor Kleine, a member of the Commission arrived in Kenya, with the object of studying the epidemiology of the disease in Central Kavirondo District: his visit extended until the beginning of September. During his visit Professor Kleine was accompanied by the Medical Officer of the Medical Department who had been detailed for sleeping sickness duty.

It had been anticipated that at Homa Point, the spot which was selected as the scene of operations, there would be no scarcity of cases of sleeping sickness. Actually it was found very difficult to discover any trypanosomes at all, in the population of those areas of South Kavirondo which were visited, viz. the Miriu River, Kadem, Karungu, the Kuja River and Rusinga Island. After examining about 4,000 people, only one case of sleeping sickness was discovered: in all, five cases were found in South Kavirondo. Attempts at infecting monkeys from the human cases, which on clinical grounds were suspected of trypanosomiasis, proved fruitless.



In the belief, founded on the recorded observation of many previous investigations, that South Kavirondo contained a large number of cases of human trypanosomiasis, preparations had been made for the erection of a hospital at Homa Point, where cases could be admitted and treated. Failure to confirm previous statements concerning the prevalence of the disease in those parts necessitated reconsideration of the position, as the result of which plans for further construction work were cancelled.

Examination of the population of South Kavirondo having failed to reveal more than one or two isolated cases of trypanosomiasis, a visit was made across the Kavirondo Gulf to Uyoma, a part of Central Kavirondo District, where Professor Kleine immediately discovered 25 individuals in which the trypanosome could be demonstrated. Upon this discovery being made it was decided that the sleeping sickness census of the population, which had been planned for South Kavirondo, should first be carried out in Central Kavirondo. This census was begun, by the Medical Officer detailed for sleeping sickness duty, about the time that Professor Kleine was concluding his investigation at Homa Point; the census was continued until the end of the year.

During that period a census was carried out in the locations of Kadimu, Sakwa, Asembo, Seme, and part of Uyoma and Alego. Over 60,000 people were examined, and suspected individuals were picked out, the diagnostic points considered significant being the cervical glands and the facial expression; attention was also paid to any likely history volunteered by the individual or his companions. These suspects were then examined for trypanosomes, either by gland puncture thick blood smear, centrifugalized blood, or lumbar puncture, one or more of these methods being employed until the provisional diagnosis was confirmed or refuted. By these means 192 cases of trypanosomiasis were certified. 97 of these cases were found in the location of Uyoma, the rate of incidence in the worst area being 5 per cent. of the population. Most of the other cases were found in certain restricted areas along the Lake shore.

All cases diagnosed were treated as far as possible, the object aimed at being to administer to each case three injections of Bayer 205, and three injections of tryparsamide, at weekly intervals. The difficulties in the way of weekly attendances on numerous cases scattered over such a wide tract of country interfered considerably with the regularity of treatment.

Besides the visit made by Professor Kleine, visits were made on two occasions during the year by another member of the Sleeping Sickness Commission, Dr. van Hoof, who was carrying out investigation on the Kenya-Uganda border. Dr. van Hoof discovered and treated 15 cases of trypanosomiasis amongst natives of Central Kavirondo who had crossed over the border. Subsequently he visited the locations of Kadimu and Samia, in Central Kavirondo. He found and treated 34 patients. Later another visit was made to Alego location.

The position, so far as it can at present be appreciated, would seem to be that in South Kavirondo there remain only a few scattered cases of trypanosomiasis. This statement must be qualified by explaining that a systematic census of the whole of the Lake shore of South Kavirondo has not yet been carried out. In Central Kavirondo, on the other hand, it appears that there are a few centres where cases are relatively numerous, viz., Uyoma, Seme and Samia.

It is stated by the Medical Officer engaged in this investigation that most of the cases diagnosed seemed to suffer but little from the infection: many of them appeared to be quite healthy, even after the disease had been present for a long period. In one case, where enlargement of lymphatic glands was said to have been noticed for more than a year, the patient looked and felt quite fit. Another patient had only just returned from twelve months employment at Nairobi and Nyeri (in the highland region) yet trypanosomes were found on gland puncture. However, other cases were found in an advanced stage of the disease, with obvious symptoms and disability, so that it cannot be assumed that the disease is invariably mild in type. Further, since there is reason to believe that fresh cases of infection are still occurring in certain areas, it would be unwise to assume that more active development of the disease is improbable.

The census of Central Kavirondo is being continued to its completion, after which it is hoped to complete the course of treatment for every individual case identified.

Bush clearing measures were carried out at the beginning of 1926 along the shore at Homa Point, and were afterwards extended to an area on the Oloach River. It was however later found impracticable to continue the work, since the time of the Medical Officer in charge of Sleeping Sickness investigation could not be devoted to supervision of the labourers, and no other responsible supervisor was available. It is to be hoped that the Administration may be able to undertake and organise the necessary measures.



**XVIII.—RELAPSING FEVER.**

Another increase in the number of relapsing fever cases is to be recorded for 1926, though this does not necessarily mean that the incidence of the disease is greater. The increased number of native orderlies trained to conduct microscopic examinations may have resulted in more accurate differentiation of the disease. The position, however, requires watching.

The actual figures for past years are as follows:—

1923.	...	...	...	...	65
1924.	...	...	...	...	91
1925.	...	...	...	...	121
1926.	...	...	...	...	188

Fort Hall, Nairobi, Kisii and Kisumu, in that order, return the largest numbers of cases.

As previously, Kavirondo and the Embu—Meru—Fort Hall Districts appear to be the centres where infection is acquired, the disease appearing later among labour in other parts of the country.

At Kisumu the search for ornithodorus infested huts and camps was continued. In contradistinction to the experience of last year a considerable number was detected. Floors and, in some cases, walls were cemented while other buildings were destroyed by fire.

Infection in a large proportion of the cases admitted to the Fort Hall hospital was traceable to badly infested labour huts along the Embu—Fort Hall—Thika road. Buildings along the Embu—Fort Hall road have been destroyed, but huts are springing up in their place. Action requires to be taken with regard to the Fort Hall—Thika section where heavy infestation is the rule.

The reports as to the results of treatment vary very greatly. From Fort Hall, where more cases than elsewhere are seen, various methods of treatment have been tried; all are stated to be unsatisfactory. The intravenous iodine method which was under trial last year is now abandoned as useless. Novarsenobillon, mercurochrome, tartar emetic and colloidal antimony have all given disappointing results.

There is little or no reason to think that a louse-borne variety of the disease is present in the country.

**XIX.—WHOOPING COUGH.**

Twenty-two cases were reported from five stations.

**XX.—ENCEPHALITIS LETHARGICA.**

No cases have been reported since 1924.

**XXI.—HELMINTHIASIS.**

An investigation was commenced in the latter half of the year at the Reformatory with regard not only to the infestation rate but also as to the effects of helminthiasis on the growth and weight. The figures promise to be of the greatest interest.

Interesting sidelights as to the effects of helminthiasis are also likely to emerge as a result of the investigations into dietetics which have previously been alluded to.

The systematic investigation of patients at the Native Hospital, Nairobi, which has become possible as a result of the increase in medical staff has shown that 62.1 per cent. of patients have harboured either tapeworm, roundworm, or hookworm or more than one variety of these.

Forty cases of schistomiasis of which one was an infection with *S. haematobium* were also discovered among patients all of whom were admitted for other diseases.

Treatment has been given in all cases.

Another fact that has become apparent is that at least three microscopic examinations are necessary in order to identify all the parasites that may be present.

**XXII.—DIPHTHERIA.**

Five cases of diphtheria came under observation in 1926, the third year that the disease has been positively identified in the country. In 1925 and 1924, 2 and 11 cases respectively were identified. All the 1926 cases occurred in Nairobi, four in Indian children and the fifth in a native. Three deaths occurred. The



occurrence of the cases was separated by considerable intervals of time and appeared to have no relation to each other.

The disease appears to have become endemic in Nairobi.

### **XXIII.—DENGUE.**

Only nine cases were reported during the year.

## **V.—LABOUR CONDITIONS.**

Although generally the sanitary conditions under which the native labourer lives and works are in many respects far from satisfactory, yet they continue to show improvement and there is little reason to doubt but that this improvement will be maintained.

Unsatisfactory conditions are not, in most cases, due to deliberate negligence or to carelessness as to what becomes of the native labourer—many employers who tolerate insanitary conditions are very popular with their labour—but to ignorance of what sanitary conditions are; to a belief that conditions which Europeans and even animals cannot be expected to stand can be borne with impunity by Africans; to an assumption that whatever an African says he prefers is good for him; and, where these ideas do not prevail, to lack of money to effect improvements the necessity for which is recognised.

The causes suggest their own remedy. It is clear that the education of the public as to the importance of sanitary conditions and the disastrous consequences of neglect is of primary importance. No permanent improvement can be effected without the support or, at any rate, the acquiescence of public opinion. Laws may be placed upon the statute book but their enforcement is impossible if they are generally felt to be oppressive or unreasonable.

To achieve a more informed public opinion propaganda methods may usefully be employed. During the year this was attempted in two chief directions, by the publication of articles representing the views of the Department in the local Press and by the attendance of a member of the Department at meetings of farmers' and settlers associations throughout the Colony. By these means the views of the Department were clearly placed before a large number of employers and opportunity was given to hear the employers' views at first hand and in an informal way.

During the year "The Native Labourers (Medical Treatment) Rules, 1926" were formulated. These make it compulsory for employers to keep certain drugs, etc., for the treatment of their sick labourers and describe the obligations of the employer as regards medical treatment. These rules do not introduce a new principle but are rather an expression and amplification of previously existing law.

With this exception no legislation as to housing, food or other conditions under which labour is to be employed has been introduced. At the present state of our knowledge it would be almost impossible to specify requirements which would be theoretically satisfactory and at the same time practicable under the varied conditions which exist throughout the Colony and in the different industries. Even if it were possible to draft satisfactory legislation such a method of procedure would at the moment be much less acceptable and would have less permanent results than the present policy of propaganda. In time no doubt, public opinion will demand definite rules—there are in fact signs even now of such a demand—but it is sounder policy at the moment to mould public opinion than to introduce legislation which would undoubtedly arouse much serious opposition and call for considerable expenditure to render it at all effective.

In general it may be said that conditions are as a rule better on the larger estates than on the smaller farms. This is fortunate, as conditions which do not show particularly bad results in a small camp or farm are liable on a large estate or camp to produce effects out of all proportion with the relative numbers of labourers.

### **Medical Examination of Recruits.**

According to law only labour recruited by a labour agent has to be medically examined and, unless there is a written contract of service, the law is easily evaded. The labourers are entrained at a wayside station and so escape the observations of all those interested in their welfare. This avoidance of medical examination is chiefly notable in the case of juvenile labourers who are too young to be employed on a written contract and it is for them that such examination is of the greatest importance.



The figures for labour examined at Kisumu during the last five years are :—

		1922.	1923.	1924.	1925.	1926.
Total number examined.	...	17,874	15,949	13,268	11,179	14,973
Number passed	...	13,619	14,442	12,056	10,263	13,453
Number rejected	...	4,255	1,507	1,212	916	1,520
Percentage of rejected.	...	23.8	9.4	9.1	8.19	10.15

These figures show an all-round increase on those for the previous two years which is accounted for by the stricter application of the provisions of the Employment of Natives Ordinance and the consequent increase in the number of labourers now examined.

Kisumu is the place where the largest numbers of labourers are examined, but the total, 13,453, passed fit during the year represents but a small fraction of the labour which goes out as will be realized when it is seen that the average number of labourers working during 1926 was 169,001 and that the average term of employment is between four and six months.

### **Transport of Labour.**

The transport of labourers by rail is still often far from satisfactory. Owing to the shortage of third class rolling stock labourers have often to travel in closed iron trucks. These are attached to goods trains and it is possible that the delay entailed, together with the absence of sanitary arrangements in the trucks and the lack of facilities for the proper supply of food and water "en route," has an effect on the sick rate of labourers who travel long distances, say, to the Coast.

It is understood that the Railway has additional third class rolling stock on order which will arrive early next year when labourers will be enabled to travel under improved conditions.

The Native Affairs Department has built during the year two rest camps which are available for labour in transit.

### **Housing.**

The sanitary and consequent economic advantages to be gained from the adoption of permanent (stone, concrete or burnt brick), or even semi-permanent (wood and iron or sun-dried brick) housing over the usual grass hut have been emphatically insisted upon and the outstanding example of the concrete housing erected at Nairobi by the Railway has been repeatedly used as an effective object lesson. Several estates and individual employers have erected an improved type of house and more are taking steps to do so. The insanitary and expensive grass hut is slowly but surely becoming recognized for what it is. Many employers, even on the smaller estates, are putting up houses of a better kind. The new accommodation may not be ideal but at all events it is a great improvement on the grass hut which is largely responsible among other things for the incidence of plague and of tick fever among native labourers.

### **Food.**

The encouraging progress towards the improvement of native labourers' rations which was noted in 1925 has been maintained. The importance of issuing a properly balanced ration is being increasingly realized and the necessity for giving labourers enough vitamin C is nearly always admitted and is frequently acted upon. Green stuff is bought or grown on the estate or citrus fruit is given regularly. Most employers state that where this addition to the ration has been tried they have experienced a decrease in the sick rate.

### **General Sanitation and Conservancy.**

While efforts are being made by many employers to improve the general sanitary conditions under which their labourers live and while a good deal of attention is being paid towards anti-malarial measures and towards the keeping down of rats, much still remains to be done. As regards conservancy pure and simple, conditions as a whole are far from good. The means provided for the disposal of human excreta and other refuse are as a rule primitive and ineffective, and except in compounds where a high standard of discipline is maintained, the naturally insanitary habits of the native combine with the lack of enthusiasm of the employer to produce a state of things which is discreditable to all concerned. It is not infrequent to find conditions which are almost ideal for the propagation of such diseases as dysentery, the enteric group and hookworm.

It is no doubt a difficult matter to devise latrine systems which will be unfailingly effective and none will work without continual intelligent supervision, but a higher standard than that generally found should be easy of attainment.



### Medical Relief.

It is not too much to say that the settlers of the country almost to a man are ready to do what they can to ease their sick labourers and, further, to help natives from the reserves who have no call upon them save that of humanity. The medical relief afforded as a rule consists in the administration of the simpler remedies and of little else. This elementary treatment may be all that can be expected on a small farm but it is far from being enough for an estate employing hundreds of labourers. It is on these estates that the provision of medical facilities is relatively most ineffective. A partially trained dresser and in some cases an inadequate temporary building called a "hospital" do not provide the treatment to which a sick man is entitled and which will get him well in the shortest time. Yet in most places this is all that is found.

Up to now Government has not assumed responsibility for the care of native labourers as such and in the eye of the law the onus lies directly on the employer and on no one else.

It may be that the Commission of Local Government which sat during the year will propose means for the provision of adequate hospital facilities in the districts, but at the present time the labourer who happens to live and work at a distance from a Government or mission hospital gets, when ill, little medical assistance worthy of the name.

### Labour employed by Government Departments.

One of the factors that delays progress in the hygiene of native labour is the conditions under which labour is employed by Government Departments; these leave in some cases much to be desired.

The Railway has set an excellent example by its efforts to provide permanent housing of a well-designed and well-constructed type. The appointment of a senior administrative officer with long experience of native labour in this country as Superintendent of Native Labour to the Railway has had a definite effect towards improving the conditions of employment as well as towards increasing the flow of labour to the Railway from the reserves.

Other departments, however, can by no means be considered model employers of labour. The type of housing in which labourers live, both in permanent lines and in temporary camps is designed and regulated according to the ideas of individuals. The scales of rations also vary in an arbitrary way and range from a balanced and complete ration to the bad old scale of posho and salt.

Railway construction has continued throughout the year. The various works have been under the medical and sanitary charge of Government Medical Officers and of the Medical Officer of the Church of Scotland Missionary Society's hospital at Tumu-tumu.

The average numbers of labourers employed and the death-rates are as follows :—

	No. of Labourers.	Death rate per mille per annum.
<b>Quarter ending 31st March.</b>		
Thika-Nyeri ... ..	2,787	4.30
Uganda Extension and Kitale Branch ...	5,629	5.68
Solai Branch ... ..	985	12.29
<b>Quarter ending 30th June.</b>		
Thika-Nyeri ... ..	2,285	5.25
Uganda Extension and Kitale Branch ...	4,816	4.44
Solai Branch ... ..		Finished.
<b>Quarter ending 30th September.</b>		
Thika-Nyeri ... ..	1,735	0.76
Uganda Extension and Kitale Branch ...	3,266	2.04
<b>Quarter ending 31st December.</b>		
Thika-Nyeri ... ..	1,173	2.20
Uganda Extension and Kitale Branch ...	3,449	2.60



### Juvenile Labour.

The question of juvenile labour is an important one from both the economic and the public health aspects. There are many kinds of work which are suitable for non-adult labour and some of them are done better by youngsters than by adults. In favour of the employment of juveniles it is advanced that they can get better food on an estate than is usual in a reserve; that they can be educated to a higher standard of living at an early age and will maintain this improved standard throughout their lives; and that the early inculcation of habits of industry will have a beneficial effect on them both morally and physically. Pre-supposing that these contentions are correct, it yet remains that these benefits are dependent entirely on the standard of living maintained on the employing estate. There is no doubt that the juvenile labourer is more susceptible to his environment than is the fully grown adult and the effects for good or evil of the conditions which surround him are more marked and more irrevocable. Hence, while it is possible, even probable, that on a good and well-managed estate juvenile labourers would derive nothing but benefit from employment, yet disastrous results may easily accrue if the employer be unenlightened or careless.

It is clear that juvenile labour should be permitted only on those estates in which the highest standards are maintained, and these standards should not be permitted to fall below a specified minimum.

## VI.—FOOD IN RELATION TO HEALTH AND DISEASE.

### Meat and Food Inspection.

Routine meat and food inspection was carried out as usual in Nairobi, Mombasa and Kisumu by the European Sanitary Inspectors attached to the Health Offices in these towns. During the latter half of the year similar inspection was instituted at Nakuru for the first time. As far as possible only inspectors who hold the Diploma in meat and food inspection are employed on these duties.

During the year the Public Health (Milk and Dairies) Regulations were applied to Nairobi. These regulations require the registration by the Local Authority of all dairies and milk shops within its area and lay down a standard of sanitation to which all such premises must attain prior to registration. The requirements of the regulations are extensive and are such as to enforce strictly the conditions necessary to ensure that milk is produced, stored and distributed in a clean manner.

### Research.

Following a visit by Dr. J. B. Orr of the Rowett Agricultural Research Institute, considerable interest was aroused in England with regard to the question as to whether the native dietary may not be seriously deficient particularly in the direction of the mineral constituents. The susceptibility of the native to such diseases as pneumonia and ulcers has for some time been considered locally to be probably a manifestation of some dietary deficiency. The matter was considered by a sub-committee of the Civil Research Committee and it was decided that research was desirable not from the point only of the native of Africa, but because also light might be thrown on some of the dietetic problems of Europe. Funds were forthcoming from the Empire Marketing Board and two officers were appointed to work in conjunction with the local service. One investigator landed at the end of the year and the second shortly after its close. Research is to be conducted on two main lines; the first into the etiology of ulcers, these being regarded in many cases as a deficiency manifestation, and the second an attempt to correlate diet and disease among the Kikuyu and Masai tribes. The particular tribes were selected as having dietary habits almost completely opposed to one another. Close enquiry into dietary customs is to be made and native foodstuffs are to be examined chemically either locally or in England. Metabolic experiments are also to be conducted.

The possible influence of helminthiasis will require to be kept closely in mind throughout the investigation.

Research on parallel lines with regard to cattle is to be conducted at the same time. The findings are likely to be mutually helpful.

The investigation is important not only from the valuable information which may be forthcoming, but also because it is to be conducted in collaboration with the local organisation by specialists from home backed by resources and information unobtainable in a Colony in an early state of development. An Imperial problem is to be examined in an Imperial way.



## VII.—SANITATION.

### SECTION I.

#### General Review.

Sanitary administration—the Local Government Commission—appointment of a Townplanning Authority for the Nairobi area—Mombasa Townplanning and Road Schemes—appointment of a Statistician—registration of births and deaths—sanitary staff in the settled areas—in the native reserves—the Sanitary Problem of Africa—recent changes—the outlook.

#### **Sanitary Administration: the Local Government Commission.**

The outstanding event of 1925 so far as sanitary administration is concerned was the appointment of a Commission under the Chairmanship of Mr. Justice Feetham, K.C., to make recommendations as to the establishment or extension of local government in Nairobi and Mombasa and their environs and in such settled areas as the Commissioners might deem suitable and to advise in particular on the following matters:—

- (1) The composition of the local governing body or bodies most appropriate to each area;
- (2) The duties and functions of such bodies;
- (3) The powers, administrative and financial and otherwise that should be bestowed upon such bodies;
- (4) The desirability or otherwise of establishing a co-ordinating authority at the headquarters of the Government and the relation of any such body, if created, with the local governing bodies;
- (5) The basis of contribution from the Central Government's funds towards the expenses of the local governing bodies.

The terms of reference of the Commission as set out above cover a large part of the field of public health administration and necessitated that full enquiry should be made as to the sanitary conditions and needs of the towns and the settled areas and as to both central and local sanitary administration in the widest sense of that term.

A large body of evidence with regard to sanitary conditions and administration was submitted to the Commission by the Medical Department and as it is understood that much of that evidence will be reproduced in the Report of the Commission it need not be recapitulated here. For the same reason it will be unnecessary to review again the organization of sanitary administration now pertaining in the Colony, or to set out in detail the sanitary conditions and needs of the towns and the settled areas. The review which was included in the Report for 1925 was prepared largely with the early appointment of the Local Government Commission in mind; it emphasized the necessity for establishing some more satisfactory machinery for promoting local development and ensuring central assistance and control than exists at present. During the year no notable alterations for the better have occurred in the sanitary conditions in the Colony as described in the Report for 1925, nor can such be expected till the machinery of sanitary administration has been supplied or improved: so far as the towns and the settled areas are concerned, it remains therefore to await the Report of the Commission.

#### **Appointment of a Townplanning Authority for the Nairobi Area.**

A further event of note in the sanitary history of the year has been the appointment of a Townplanning Authority for Nairobi and its environs to a distance of ten miles from the centre of the town. The Authority so appointed has considered the preparation of a townplanning scheme for the area at some length and the result of these investigations, together with recommendations, have been embodied in a report which is to be submitted to Government early in 1927. The Authority has been severely handicapped in that it has been without the services of an engineer or of any staff experienced in the preparation of municipal improvement, housing or townplanning schemes; the scope and nature of its recommendations will of necessity be affected thereby. Nevertheless it is a matter for satisfaction that many of the problems of the town and of its environs should have been considered in their relation to each other and more especially that they should have been the subject of discussion by a body which included not only local residents but also other members of the public who might not otherwise have had an opportunity of investigating and becoming acquainted with an important problem in urban development.

The investigation which has been carried out cannot but emphasize that Nairobi will not be an efficient or pleasing city till satisfactory financial provision has been made for its development.



### **Mombasa Townplanning and Road Schemes.**

It is satisfactory to record that the important Townplanning Scheme for the undeveloped portion of Mombasa Island has been approved by Government and is now being carried into effect. It is unfortunate that at the end of the year the Responsible Authority was still without the assistance of an engineer with municipal experience to advise and assist it. It is likewise unfortunate that the local authority responsible for devising and carrying out the new road scheme for the Old Town, which has been in progress during the latter half of the year, has also had no adequate technical assistance. The necessity for the services of an engineer with municipal experience of a high order is for Mombasa a matter of grave urgency.

### **Appointment of a Statistician—registration of births and deaths.**

No account of the events of 1926 which are of sanitary importance would be complete without reference to the appointment of a Statistician to the Governors' Conference Secretariat. To a large degree the evaluation of sanitary conditions and of the result of sanitary effort is dependent on accurate statistical records. Of such records, among the most important are those which deal with the constitution of the population and which are obtained by registering births and deaths and by census. No general registration of births and deaths is yet compulsory in Kenya and it is no exaggeration to state that such records as are made are all but valueless for statistical purposes. Since adequate information with regard to the constitution of the population and the changes which may be taking place is of prime importance in the statistical treatment of almost all records of economic interest, it may be presumed that the appointment of a statistical officer will result in the institution of an efficient system of registration of births and deaths and of a census which will be of value and assistance in public health administration.

### **Sanitary Staff in the Settled Areas.**

At no time in the history of the Colony and Protectorate has the sanitary staff been adequate either in numbers or experience. By 1925 the discrepancy which had always existed between staff and needs had become very great and proposals for its reduction were in that year approved by Government to the extent then financially practicable. In 1926 effect was given to some of these proposals and during the year it has as a result been possible to post an Assistant Medical Officer of Health to each of the towns of Mombasa and Nairobi, to post an additional Health Visitor in each of these towns, to increase the number of Sanitary Inspectors, and to make a beginning in the control and improvement of sanitary conditions in one of the smaller towns by opening a Health Office in Nakuru under the charge of a qualified Sanitary Inspector. The institution of a Health Office at Nakuru has more than justified itself and has also emphasized the urgent necessity for posting a Sanitary Inspector at Eldoret and for detailing a Sanitary Officer to carry out the duties of Medical Officer of Health for these towns and for the rapidly developing districts in which they are situated. Owing to unavoidable delay in the filling of sanctioned appointments, the latter postings could not be effected in 1926, but there is now a good prospect of their being carried out early in the coming year. When these postings are made the proposals which were approved in 1925 for the augmentation of the Sanitary Staff and the establishment of a more adequate health service will largely have been carried into effect and in the towns and in parts of the settled areas the discrepancy between staff and needs will have been considerably reduced.

### **Sanitary Staff and Service in the Native Reserves.**

In a recent report\* on Rural and Urban Health Administration in the State of New York by Sir Arthur Newsholm, late Principal Medical Officer to the Local Government Board of England, there occurs the following statement:—

“ No public health administration is complete which disregards the need  
“ for treatment of existing disease, as a means of preventing the ulterior  
“ and more serious results of the disease in question. This statement is  
“ axiomatic, and its importance is being increasingly realised in public  
“ health work in every country.”

It is also an axiom, however, that no public health administration is complete which relies solely on the treatment of disease as a means of prevention and disregards the need for the teaching of hygiene and for removing the causes of sickness.

Both axioms are important. In the settled areas of Kenya the importance of both is being increasingly realised and effort is now being made both by Government and the public to give effect to them. The matter has also been the subject of careful consideration by the Local Government Commission.

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\* “ The New York Health Demonstrations ” by Sir Arthur Newsholm. Published by the Milbank Memorial Fund, 1927.



With regard to the native reserves, on the other hand, it is still necessary to emphasize the importance of the second axiom, namely, that no public health administration is complete which relies solely in treatment, for in these reserves no systematic effort has yet been made to give effect to it. Speaking generally the work of the Medical Department in the native reserves remains confined to the treatment of the sick since no sanitary officers have been appointed for these areas, and the ever pressing demands for the provision of treatment leave the already over-burdened Medical Officer with no time to undertake systematic preventive work, to initiate or supervise the teaching of hygiene, to investigate the conditions which result in disease, or to play any large part in advising the local authority as to where and how these conditions should be altered.

In 1925 the necessity for providing Medical Officers of Health in five of the more developed native reserves was carefully considered by Government and the principle of making such appointments was approved. It was, however, impossible to give effect to the proposal either in 1926 or in the current year and at the present date no sanitary officer is available for service in the native reserves. It is most earnestly hoped that a similar position will not last throughout the coming year, and that at an early date some provision will be made to deal with the vast field of preventive work in the reserves and to gain essential experience as to how this work may best be prosecuted.

### **Sanitary Problems in Kenya.**

In other chapters of this Report, as well as later in the present chapter, reference is made to many important specific sanitary problems commonly encountered in Kenya, and the measures which have been taken or which may be required to deal with the emergencies arising therefrom are there set out in some detail and discussed from the standpoint of recognized technical procedure. On that account and because the specific sanitary problems of Kenya differ in degree rather than in kind from those which arise elsewhere, and because no new or original methods of treatment have been employed, it is unnecessary to burden a general review with an enumeration of these problems or with an account of the action taken to deal with the emergencies. It is, however, of fundamental importance that the problem and the emergency should not be confused nor the problems forgotten in the interest aroused by the emergency. So long as the problems remain unsolved the emergencies will be recurrent and it is essential that it should be recognized that at the bottom, sanitary problems are problems in administration and finance and for their solution depend primarily on administrative ability and efficiency and only secondarily on technical skill. The removal of conditions which give rise to recurrent sanitary emergencies or are continuously inimical to health is one of the chief objects of public health administration, and no review of sanitation would be complete which was confined only to the treatment of emergencies and ignored the administrative problem and took no account of changes which have occurred to make possible further progress towards the elimination of insanitary conditions. More especially is this so if changes have occurred which present possibilities of sanitary progress greater than have hitherto been contemplated by the sanitarian or the administrator. In order, however, to make clear the change now taking place and the manner in which it may be utilised to hasten sanitary progress, it is necessary to appreciate the essential sanitary problem of Kenya on the solution of which depends the permanent solution of almost all subsidiary sanitary problems whether of the native reserves or of the settled areas.

The essential sanitary problem of Kenya is not peculiar to the Colony, but common to the Continent. It is the sanitary problem of Africa. A number of its constituent conditions were described in some detail in the Annual Medical Report of the Colony for the year 1922, but as the problem has never been clearly defined in these Reports, it becomes necessary to attempt a definition.

### **The Sanitary Problem of Africa.**

The sanitary problem of Africa is how to improve the standard of living among a population of some millions of persons; in many cases poorly developed physically; at a low stage of civilization and comparatively uneducated; living under primitive and fundamentally insanitary conditions; with, in most cases, a high birth-rate, a high death-rate and a high infantile mortality rate; suffering from preventable diseases; in occupation of fertile land but without the ability to use that land to the best advantage.

Such is the essential sanitary problem of Africa and while elsewhere it is seriously complicated by the fact that even aspirations are lacking, yet so far as Kenya is concerned, this is no longer so. In Kenya at least the problem is no longer insoluble, since no longer is it the case that the native has but few wants, or that apart from the instincts which prompt him to satisfy his hunger and reproduce his species there is little but apathy; for though till recently there was but little evidence to suggest that the impact of western civilization on the African had affected him more than superficially or in any fundamental way had altered his outlook on life, signs are not now wanting that deeper changes have occurred and that from his age-long lethargy the African in Kenya is at last awakening.



The directions in which awakening is taking place are not few, but it is in the urgent desire for education now all but universal among the younger generation that there lies the possibility of sanitary progress. But it is not alone on literary or technical education, nor even on sanitary education, that sanitary progress depends and it is only indirectly that the desire for education will secure such progress. Material prosperity is also essential and the populations of Africa are still poor. Sanitary progress and education are beyond doubt interdependent but both are dependent on material prosperity. It is by utilizing the desire for education to spur the African to achieve a degree of prosperity which will make both education and sanitation a possibility and to make that self-imposed effort on which both education and permanent sanitary progress depend that progress may now be achieved. If the desire for education has not yet so spurred the African it is because he has not yet been clearly shewn how the surplus of his fields could be exchanged for schools. The African himself is faced not primarily with a sanitary problem but with a problem in administration.

It remains to consider how the problem may be solved and the following extract from the Annual Medical Report of 1922 is relevant to the point at issue. It was then stated that:—

“ At present the native population of Kenya is still purely individualistic and there is no community of purpose. The outlook on life does not extend beyond a plot of land and what it can produce. Can then interest and a purpose be supplied? It would appear that it can. The comparison between a town which has not achieved local government and the same town after it has been given some measure of control of its own affairs with the responsibility for finding funds for those improvements it may require seems to supply the answer. Hitherto the benefits which the native has received from a settled and civilized government have come to him independently of his own volition. Medical Officers, roads and other services materialize in a fashion which is not understood, and it is not realised that the money which pays for these comes from the people as a result of taxation. Were it possible to allot a sum of money, however small, to each district to be spent by the people themselves through the activities of a local council presided over by the District Commissioner it would not be long before the glimmering of a common interest would be aroused and could these funds be collected by the people themselves that sense of responsibility would be engendered which is ever the forerunner of progress.

“ But all this would require direction.”

Since the above was written Local Native Councils have been established with wide and comprehensive powers among which is the power to raise funds locally for local purposes. To a certain extent and not infrequently with great wisdom they have exercised these powers but the difference between conditions in 1922 and the conditions which prevail to-day lies in the fact that in their greatly increased desire for education the people as a whole have now an interest which beyond all others might be made object of a common purpose. But direction is still lacking and, equally important, the financial provision from central funds is not yet made on any definite basis clearly connected with local needs and efforts, and the immense stimulus which might be supplied by the establishment of a definite relation between central contribution and the results of local initiative is therefore wanting. A part only of the machinery of local government has so far been supplied.

The analogy of conditions in the settled areas is not inappropriate. In these areas and in the larger towns sanitary progress had by 1926 in many respects all but come to a standstill and what little was happening in some directions was more than discounted by the retrogression which in other directions was resulting from unorganised development. In evidence laid before the Local Government Commission by the Medical Department it was stated that insanitary conditions in the towns and settled areas resulted chiefly from the following causes:— lack of local interest since there was no local responsibility, lack of funds, lack of experienced technical staff, and lack of a co-ordinating central authority specifically organized with a view to securing efficient local administration and promoting local development. In considering the sanitary problem of the native reserves the terms of reference of the Local Government Commission quoted at the beginning of this review are not without interest. In the native reserves the local authorities it is true have already been established and they are ready to be interested, but though their powers are wide, their responsibilities are indefinite. Interest, economical administration and, equally important as regards sanitation, discipline are all dependent on the imposition of clearly defined responsibilities and without the check of responsibility powers are unlikely to be used to the best advantage. The sanitary problem of the native reserves no less than that of the settled areas is therefore a problem in administration.



### **The Outlook.**

In the towns and in the settled areas, now that the problems there presented have been the subject of investigation by a Commission equipped and established for that purpose, the outlook is more promising; in the native reserves important changes have taken place and perhaps for the first time there is a prospect of far reaching development. There are still many difficulties in the way and a comprehensive investigation is urgently required, but the problem is no longer insoluble.

Were the Local Native Councils put in a position to take a more prominent place in the organization and provision of educational facilities, it would not be long till, as a result of the imposition of local rates, a stimulus would be given to production on a scale which would provide a surplus sufficient not only for educational purposes but for the general improvement of environmental conditions and would make possible that raising of the standard of living and efficiency by which alone the majority of sanitary emergencies can be eliminated and prevented from recurring.

## **SECTION 2.**

### **Sanitary Administration—work of the Medical Department—Legislation.**

A very comprehensive review of the system of sanitary administration in vogue in Kenya was provided in the Report for 1925. The system then described still pertains and no alterations of importance have been made. The work carried out by the department during 1926 has been on the general lines indicated in the Report for the preceding year and as the new appointments which had been sanctioned for 1926 did not for the most part become effective till late in the year, there has been little extension in the scope of the work undertaken.

#### **Legislation.**

No new legislation of importance affecting the Public Health or Sanitary Administration has been passed during the year. Some progress was, however, made with regard to the draft Drainage Regulations which have frequently been referred to in these Reports and as the result of detailed discussion with non-official members of the engineering and architectural profession agreement has now been reached on most of the controversial points which arise in connection with legislation of this nature.

With regard to a new and more modern and complete code of building regulations, similar progress has not however been possible: nor would it appear likely that substantial progress will be achieved with regard to this very technical matter until the services of an engineer with municipal experience are available. The necessity for a very thorough revision of all building law and of township law dealing with matters of sanitary interest is very urgent. It is earnestly hoped that as a result of the investigations carried out by the Local Government Commission arrangements may be made which make such a revision practicable.

## **SECTION 3.**

### **Housing and Townplanning.**

The appointment of a Townplanning Authority for Nairobi and the approval of the Mombasa Townplanning Scheme and the Road Scheme for the Old Town of Mombasa have already been referred to as matters which have taken place in 1926. With regard to the smaller towns also a considerable amount of useful work has been carried out more particularly by the Land and Survey Offices with a view to reaching some degree of finality with regard to lay-out and securing some control over future development.

It is very necessary, however, that it should be clearly realised that all "townplanning" work which so far has been carried out in Kenya has mainly been directed towards opening up new land for building, facilitating traffic and securing convenience of development and that the many distressing housing problems which have arisen in the country as a result of past development have not yet been directly approached. Work of the nature indicated above is of inestimable value and in many cases represents an essential preliminary step in the direction of solving a housing problem, but in itself such work is not always sufficient to enable the requirements of the population with regard to housing to be met and especially is this the case in the towns of Kenya. In almost all these towns there are to-day large numbers of Africans and Asiatics for whom no reasonably decent and sanitary accommodation is available and in almost all, there are slums which are worse than many of the slums of old established European cities. Not only in the old town of Mombasa, but also in



Nairobi—a town scarce more than a quarter of a century established—there are slum properties and slums of the worst description. Furthermore, these slums are growing. If townplanning in Kenya is to be effective in producing pleasant and efficient towns it is of paramount importance therefore that attention should be specifically directed towards the provision of housing and the clearance of slum areas. At the present moment urbanization in Kenya is in too many cases synonymous with the establishment of slums. The significance of this fact is very grave but the results which must inevitably follow from the continuance of these conditions need not be detailed here. The conditions have only to be realised for their significance to be appreciated. It is, however, undoubtedly the case that they are not generally realised. In order that the conditions which obtain in these slums may be more fully realised it is therefore proposed that during the coming year detailed surveys should be carried out by the staff of the Sanitation Division of the Medical Department with regard to as many slum properties as possible. It must, however, be emphasised that once the survey has been carried out the sanitary officer can do no more; slum properties such as exist in Mombasa, Nairobi and other towns in Kenya can seldom be improved, and demolition is as a rule the only effective measure. But when the number of properties is large, demolition is not a matter which should be attempted by means of a sanitary notice and more particularly is this so when there is an acute shortage of housing accommodation and when the arrangement of streets and plots is not such as to allow of convenient or sanitary reconstruction. In Mombasa and Nairobi the number of slum dwellings is so large and their condition so insanitary that effort spent on securing improvements by means of sanitary notices has no appreciable effect on general conditions and in many cases is of but little value in respect even of the individual buildings. The matter is no longer one which can be dealt with by the Health Officer and his inspectors but one which can only be dealt with by means of comprehensive housing and improvement schemes.

In Nairobi a certain amount of work has already been inaugurated by the Municipal Council with a view to providing a certain amount of sanitary housing for Africans. Elsewhere nothing has yet been done to meet the needs of the general African population. In Nairobi, Mombasa and in the smaller towns the problems which are presented by the necessity for the provision of housing and the clearance of slums are the most important with which the local authorities are faced. It is of the utmost importance that the urgency of the matter should be realised and that it should receive a greater measure of attention than has been the case hitherto. It is also essential in order that the local authorities concerned may be able to take effective action, that the central government authority should be in a position to assist these local authorities in solving the complicated administrative and financial problems which arise in connection with all housing and improvement schemes.

The work which requires to be done may be divided into two groups:—

- I. (a) The provision of sanitary housing for Asiatics.
- (b) The clearance of slum areas at present in Asiatic occupation.
- II. (c) The provision of housing for Africans, and
- (d) The clearance of slum areas at present in African occupation.

The work included in the first group presents no unusual problem and provided the requisite administrative organization were set up, could be carried out without difficulty according to established and proved procedure.

The work included in the second group presents on the contrary many problems for the solution of which but little experience is available. For the comparatively uncivilized African native the change from rural to urban conditions is very great and if great care be not taken the change may result in great harm. The course which the development of the native urban communities which are coming into existence will follow will be to no small extent dependent on the housing arrangements which may be made. Large issues are involved at every step and few questions merit more careful consideration than that of how the growing native populations of the towns might best be constituted and organized. The housing of Africans in townships is the most important problem which arises in connection with townplanning in Kenya at the present time.

#### SECTION 4.

##### **Sanitary Conditions, Sanitary Administration and Housing and Townplanning in:—**

- (a) Native Reserves,
- (b) The Settled Areas (Rural),
- (c) The Settled Areas (Smaller Townships),
- (d) The larger Townships—Nairobi and Mombasa.



## (a) NATIVE RESERVES.

During the year no general alterations have taken place with regard to sanitary conditions in the Native Reserves and but little can be added to what has already been said in describing these conditions in previous Reports. The essential problem which is presented in the Native Reserves has been referred to at some length in the first section of this chapter and until advantage can be taken of the opportunities there recounted, it is unlikely that it will be possible to record at the end of any year that marked changes for the better have taken place in the environment of the African native. Of sanitary administration in the reserves all that can yet be said is that for all practical purposes there is none. That there is need for the establishment of an effective system is probably to some extent appreciated, but it is doubtful whether it is generally realised either that the organization which is needed would be required to deal with many matters of the kind which ordinarily come within the scope of "municipal" administration, or that the establishment of such an organization would not necessarily present great difficulty. Only one matter need be taken as an example, townplanning.

Townplanning, if the term be used in the wider sense, is a matter which demands attention in the native reserves equally as in the settled areas. A number of problems are presented and among these are the following :—

## (a) THE PLANNING OF THE TOWNS WHICH ALREADY EXIST AND THE PLANNING OF NEW TOWNS.

At present these towns are towns only in name and consist of but little more than a few government buildings and lines, a few Indian shops and a native village of seldom as many as a hundred huts. But as development proceeds, as the natives become traders and tradesmen and as the standard of living of the inhabitants of the district proceeds, more than a government station and a few shops will be required. It may be that development will not in all cases take place around the present government stations but will occur rather at or near the large native markets, but wherever urban development may take place it is of importance that it should be the subject of careful and skilled direction and it is not too early to consider the lines which this development might best follow. Not infrequently urban development is insidious at the beginning and remains all but unnoticed and uncontrolled till conditions have arisen which though they may be capable of alteration at the expenditure of trouble and money may nevertheless leave a legacy of disease and custom less easy to eradicate.

## (b) THE PLANNING OF THE NATIVE RESERVES.

There is also for consideration the question of the "planning" of each reserve as a whole. Permanent housing is coming into fashion in the native reserves. Inevitably the question of land tenure arises and settlement of this question is essential to sound planning. It is for consideration how these new houses and holdings should be disposed and where villages should be situated. Haphazard growth might be unfortunate. It is not suggested that a detailed plan could or should be made for each reserve at the moment, but there are many factors to be considered in the siting of houses and villages which if ignored will lead to untoward results: it is suggested that there are problems here which merit attention, and that research as to present and future needs is urgently required.

The native boma of to-day is perhaps as insanitary a place as can be imagined, but it is not a slum; if, however, the native of the reserve adopts without direction fashions of building and methods of living which are foreign to him, it is not unlikely that he may establish on his holding conditions which, though in certain directions an improvement on the old, may on the whole be worse. A stone house and clothes may indicate advance but if they cannot be kept clean and in order some of the essential conditions of slumdom will have been established. One factor of particular importance may be mentioned—water supply. Much useful work might be carried out with regard to these matters if loans could be advanced by Government for which local rates would supply the interest and sinking fund—part of the machinery is already in existence, the Local Native Councils—for the conservation of the water supplies in the reserves and for making these supplies available for domestic as well as agricultural purposes. Convenient and pure water supplies are of primary importance if infantile mortality is to be reduced and if any headway is to be made towards producing a healthy adult population. Are the farm houses and villages of the future to be built where they can have piped supplies or not? The suggestion that much could be done even now to provide such supplies or intimately to assist social development is not fantastic. It is more than probable that many natives would welcome advice as to where and how they might best build their houses or the community its village and could



they but be shewn how by contribution they could improve their water supplies, the contributions would readily be forthcoming. There are no real difficulties but there is a deal to be done.

- (b) THE SETTLED AREAS (RURAL).
- (c) THE SETTLED AREAS (SMALLER TOWNSHIPS).
- (d) THE LARGER TOWNSHIPS—NAIROBI AND MOMBASA.

The sanitary conditions and the method of administration in the towns and settled areas have from time to time been described in these Reports and in the Report for 1925 they were described in detail. That these conditions, more especially in the towns, are far from satisfactory is well-known. In the towns the needs are many and in most cases these needs can only be met if considerable expenditure be incurred.

Good scavenging, good drainage, water supplies, abattoirs, markets, roads, houses, parks and playing fields are one and all dependent on financial provision and the elimination of plague, malaria and tuberculosis is primarily dependent on that provision being made. The oiling of standing water and the trapping of rats are but expedients and they are of limited application only. By 1925 it had become generally recognised that only by a comprehensive measure of administrative reform could financial provision be made possible and machinery established which would ensure economical and effective expenditure. The Local Government Commission which sat during the latter half of the year has submitted the whole question to an exhaustive investigation and will doubtless make suggestions with regard to the institution of the necessary administrative machinery. Until a system of public health administration has been established more equal to the task of meeting present-day needs than that which now obtains, there will be little to record at the end of any year than the fact that plague and malaria are still endemic and that tuberculosis appears to be increasing.

#### **General Sanitary Operations—Nairobi and Mombasa.**

Throughout the year a Medical Officer of Health and from four to six European Sanitary Inspectors were retained in each of the towns of Nairobi and Mombasa. Throughout the year also an Assistant Medical Officer of Health was posted in Nairobi. A similar appointment was not, however, made effective in Mombasa till November. Routine work in connection with the inspection of premises, the abatement of nuisances, food and meat inspection, scrutiny of building plans, mosquito prevention, rat destruction, inspection of licensed premises, etc., was carried out as usual. As the record of such work is of local interest only it is not proposed to incorporate details in this Report.

With regard to the various branches of routine work referred to above, it is, however, necessary to emphasize the fact that from the work which is undertaken with a view to the abatement of nuisances no lasting benefit is as a rule secured where thoroughly unsound and insanitary premises are concerned. Unfortunately the great majority of the nuisances in Nairobi and Mombasa arises in connection with premises which are so dilapidated, or so unsuitable, either on account of structure or design or situation, for the purpose for which they are used that permanent abatement of the nuisances can seldom be secured unless by complete demolition of the premises or by change of use. As a result the abatement is only temporary, no radical improvement of the building is secured, and the owner is involved in expenditure which so far as he is concerned is profitless. But the fact that he was involved in such expenditure will not be forgotten by the owner at a later date when the question of the acquisition or demolition of the property may arise in connection with slum clearance. The existence of this difficulty has already been referred to in another connection in a previous section dealing with townplanning and housing; the point which it is here desired to emphasize is that delay in the preparation and execution of slum clearance and improvement schemes involves a section of the public in profitless expenditure, makes the execution of these schemes more expensive and either entails the employment of more Sanitary Inspectors than would otherwise be necessary, or prevents these officers from engaging in work more likely to be productive of lasting benefit. It follows that the continued existence of slum property involves the whole body of the ratepayers in recurrent but unprofitable expenditure.

### **SECTION 5.**

#### **Maternity and Child Welfare.**

Two trained European Nursing Sisters were maintained at Nairobi and two at Mombasa throughout the year.

In Nairobi clinics were held regularly at the Health Office, in the native location of Pumwani and in the native railway quarters. The attendance at the clinics has been good and much useful work has been done.



In addition, the Nursing Sisters have made a large number of visits to the houses of Africans and Asiatics. This health visiting, though less attractive and conspicuous than the holding of clinics, is infinitely the most important and productive part of all work in connection with maternity and child welfare.

In Mombasa the amount of work carried out in connection with the clinic held at the Health Office was very large. The figures for the year are as follows :—

Visits of mothers and children to Clinic	...	...	6,272
New cases	...	...	1,527
Outside visits made by Health Sisters	...	...	8,400
Vaccinations	...	...	1,036

#### **Voluntary Effort.**

In August the cause of preventive medicine in Mombasa was definitely helped by the opening of an African Child Welfare Centre and Maternity Home in the native part of the town. This new centre was provided by means of funds raised by voluntary subscription and is of great importance as representing a beginning in voluntary public health work. Two native female nurses who had been trained in Uganda were attached to the centre.

The new centre which has just been established in Mombasa is only the first of a number of centres of a similar nature which are to be opened in Mombasa and in other towns by the Child Welfare League which has been established during the year as a result of the enthusiastic work of the Hon. Lady Grigg.

### **SECTION 6.**

#### **School Medical Inspection.**

The school accommodation provided by Government cannot be said to be altogether satisfactory and in some cases is the reverse of satisfactory. Provision has, however, been made from Loan Funds for the replacement of some of the more obsolete buildings and in the case of the European School in Nairobi work has already commenced.

With regard to the accommodation provided by private enterprise, no general inspection has been carried out by the Medical Department and detailed information is therefore lacking.

#### **Medical Inspection of School Children.**

It had been hoped that during 1926 it might have been possible to undertake more work in connection with the medical inspection of school children and to place the work on a proper basis.

An inspection of the Government School for European children at Nakuru was carried out by the Senior Sanitation Officer attached to Headquarters in conjunction with the District Surgeon who acts as medical attendant to those pupils who are boarders. This inspection showed that on the whole the health and physical condition of the children attending the Nakuru School appeared to be satisfactory.

An attempt was also made to institute the medical inspection of African and Indian school children attending school in Nairobi, but the number of inspections was too few to allow of any general deductions being drawn from the results.

As a result of the attempts which have been made to inaugurate school medical inspection it has become very clear that no systematic work can be inaugurated nor any valuable results obtained until a whole-time school medical officer can be appointed. The field of work which ought to be covered is large and should include not only the medical inspection of school children of all races in all parts of the country, but also the sanitary inspection of schools, the inspection of the teaching and practice of hygiene in these schools, consideration of dietaries, clothing and hours of work of school children and the method of providing treatment for disease. In connection with the schools in the native reserves alone the amount of work to be done is very large. That one officer could undertake the whole of this work is, of course, impossible and one of two courses will therefore require later to be followed to a greater or lesser extent; either a staff of specialist school medical officers will require to be built up, or the district health officer or one of the district medical officers will require to undertake the school work in each district. Which course ought to be adopted cannot be decided at present. What is essential for the moment is to determine what work requires to be done and to establish a system of inspection; for that purpose one officer with previous experience of school work in England is required. The importance of making such an appointment can hardly be over-emphasized and two aspects of the question may be referred to :—



- I. Time and money spent in an endeavour to educate children who are not physically fit but who might easily be made fit is not spent to the best advantage. There is reason to believe that many of the children attending native schools are ill-conditioned from one or more of the following causes :—

—Intestinal worms.

—Malaria.

—Food deficiency.

- II. To a very large extent it is only through the school population that insanitary custom can be attacked.

Up to the present it has not been possible for officers of the Medical Department either to devote particular attention to the health of the school child or to use the opportunities which in the schools alone are presented for the teaching of hygiene; only by the neglect of other important work could they have done so and until there is an officer or officers free to devote time and thought to the needs of the school child, the health of the school child will be likely to remain neglected and the opportunity of the schools unused.

## SECTION 7.

### Measures taken to spread the knowledge of Hygiene and Sanitation.

During the year a pamphlet was published by the Department on the Housing and Care of African Labourers on Farms and Estates and a series of articles on the general care of labour was also published in the public press. In addition, a good deal of personal propaganda was carried out by the Senior Medical Officer Labour with regard to these subjects. Apart, however, from these efforts it has not so far been possible to engage in systematic propaganda with regard to hygiene and sanitation and though hygiene is a subject in the curriculum of most schools, effective liaison with the Education Department with regard to this matter has still to be established: for its establishment the appointment of the school medical officer would appear to be essential.

## SECTION 8.

### Training of Sanitary Personnel.

No attempt has so far been made in Kenya to train African natives as Sanitary Inspectors and in the opinion of the Department any attempt to institute such training at the present time would be premature and unwise. That native Sanitary Inspectors will be required in the native reserves is undoubtedly the case and it is hoped that the time is not far distant when every "location" in each reserve will be provided with one or more Sanitary Inspectors; but an essential condition of the establishment of such a native service is the establishment of local authorities by whom the inspectors could be employed and to whom they would be responsible. To provide the Medical Officer or the Medical Officer of Health of a native reserve with native Sanitary Inspectors would, under present conditions, however, be unwise. Natives placed in a position of authority and responsible only to an European superior, unless they are subject to a degree of discipline and supervision which in the case of sanitary staff of this description can never be provided, will in the majority of cases be likely to abuse the authority vested in them. Through fear complaints would not as a rule be made by the native public, opposition to sanitary measures would be engendered and no progress would be secured. Till the native Sanitary Inspector can be employed by a Native Authority which, because it pays for him, will ensure that he does a reasonable days work and which will be in a position—subject for preference to the approval of a higher authority—to dispense with his services if he abuses his authority, the establishment of a native inspectorate cannot be recommended.

Real progress in sanitation is seldom achieved by compulsion which is without the support of public opinion: the object of the Government Medical Officer of Health of a native reserve should be to educate the local native authority to the point at which it will realise the need for domestic sanitary inspection and request permission to employ an inspector. Thereafter as the inspector of the work carried out at the instance of the local native authorities the Medical Officer of Health will perform useful service which will be generally appreciated and he will be in a much better position effectively to direct and control development than would be the case were he in a more autocratic position.



## SECTION 9.

### Recommendations.

#### (a) DEPARTMENTAL.

In the preceding Sections it has been indicated that an extension of the activities of the Sanitation Division of the Department is required, more particularly with regard to schools and the native reserves. The necessity for providing further sanitary staff in the large grain farming districts of the settled areas has also become increasingly obvious. It is therefore recommended that the staff of Sanitary Officers should be sufficiently increased in order to allow of the following appointments being made :—

1. Medical Officer of Health in at least one native reserve.
2. School Medical Officer and liaison Officer with the Education Department.
3. Medical Officer of Health for the townships of Eldoret and Kitale and the Uasin Gishu and Trans Nzoia Districts.

#### (b) EXTRA DEPARTMENTAL.

Under the heading "Recommendations" reference was made in the Annual Report for 1925 to a number of specific matters which require attention. These were as follows :—

- (1) "Improvement schemes with regard to the more insanitary areas of Nairobi, Mombasa and the smaller towns."
- (2) "Housing schemes aimed at providing adequate and sanitary housing for African natives in Nairobi, Mombasa and the smaller towns."
- (3) "Sewerage schemes for Nairobi, Mombasa, Nakuru, Kisumu, Eldoret and possibly Kitale."
- (4) "Water supply schemes for Nairobi, Mombasa, Kitale and a number of administrative stations."
- (5) "Improvement of refuse removal systems."
- (6) "Improved control of building operations."
- (7) "Townplanning generally."
- (8) "Advice and assistance to local authorities including Native Councils and District Commissioners in all matters of municipal and general sanitary administration."
- (9) "The improvement of environmental conditions in the native reserves."
- (10) The appointment of a Government Townplanner and Sanitary Engineer.

With regard to the majority of the matters referred to above, but little has been accomplished during the year under review but it is satisfactory to be able to record that all such as relate to the non-native areas have been the subject of careful and lengthy consideration by an important Commission. As has been indicated in the earlier Sections of this Chapter the needs of the Colony are many and are for the most part such as can only be met if large financial provision can be made. It has also been indicated that in order to enable this provision to be made and thereafter to be economically expended suitable administrative machinery must be established. The establishment of such machinery stands as the most important recommendation which can be made. As, however, this matter was included in the terms of reference of the Local Government Commission it is unnecessary to do more at the present time than to emphasize its importance and to point out that if sanitary progress is to be achieved generally throughout the country, suitable machinery is required for the native reserves as well as for the settled areas.

## VIII.--PORT SANITATION.

### (a). GRANTING OF PRATIQUE AND ISSUE OF BILLS OF HEALTH.

The steady increase of shipping at Mombasa is shown by the following table :—

VESSELS ENTERING MOMBASA OR KILINDINI HARBOURS.							
				1923	1924	1925	1926
Steamships	...	...	...	380	383	439	524
Dhows	...	...	...	558	223	242	412
Total				938	606	681	936



The nett tonnage of steamers calling at Mombasa during the past four years has been as follows :—

1923	...	...	...	...	946,029
1924	...	...	...	...	1,037,631
1925	...	...	...	...	1,180,535
1926	...	...	...	...	1,444,320

Bills of Health issued to ships leaving for foreign ports during 1926 was 624.

#### (b). INFECTIOUS DISEASES ON VESSELS ARRIVING.

During the year no vessel arrived at Mombasa with any serious infectious disease on board.

#### (c). EXAMINATION OF FOOD AND SECOND-HAND CLOTHING.

A considerable amount of food was inspected at the request of Agents and Importers and under the Port Health Regulations all imported second-hand clothing was examined. The number of articles of second-hand clothing passed through the Customs during the year was 16,855.

## IX.--HOSPITALS, DISPENSARIES AND INSTITUTIONS.

### I.—GENERAL REMARKS.

The figures relating to admissions to the various Government Hospitals throughout the country show an all round increase largely due to the malaria epidemic.

The comparative table is as follows :—

	IN-PATIENTS.			DEATHS.		
	1926	1925	1924	1926	1925	1924
European Officials ...	1,199	875	594	6	6	4
Non-European Officials ...	4,772	3,655	2,554	8	8	5
General European Population	914	855	723	18	13	23
General Native Population...	22,856	21,112	25,990	1,064	898	786

Government has accepted the principle that separate hospitals, supported from central funds, shall not be maintained for the different communities. In the future accommodation for the various nationalities will be grouped under one administration; an arrangement leading obviously to ease of administration, efficiency and economy. The decision with regard to the principle of communal hospitals in Nairobi, each controlled by its own board of management, has been reversed: the administration therefore of the European Hospital remains unchanged.

No separate hospital has yet been provided for Asiatics. A small Asiatic nursing home is in existence in Nairobi.

The question of the provision of hospitals in the smaller townships and in farming districts has been under consideration by the Local Government Commission. Important recommendations are likely to eventuate.

As a result of the increase of Medical Officers it was possible to re-open Kacheliba as a medical station by the posting of a Sub-Assistant Surgeon hitherto required for service at one of the larger hospitals. Temporary buildings only are available. It will be remembered that, prior to retrenchment, Kacheliba was maintained as a medical station with a Sub-Assistant Surgeon in charge.

With the exception of the foregoing, no new hospitals have been opened during the year.

The general increase in efficiency of the hospitals which has occurred as a result of the increase in staff has been referred to under the heading "Administration."

### 2. EUROPEAN HOSPITALS.

With the exception of the completion of the operating theatre at Mombasa, no constructional work or improvements of any magnitude have taken place during the year at any of the Government European hospitals.

The comparative table of total admissions is as follows :—

	1926.	1925.	1924.
Total number treated	995	802	602
Total number discharged	948	754	567
Total number of deaths	23	17	21
Total number remaining	24	31	14



The considerable increases may be due to a small extent to an increase in the population, but are mainly the result of the malaria epidemic already referred to. It is notable that 33.1 per cent. of the total admissions was due to malaria.

The figures do not by any means represent the total morbidity for the European population of the country. The Eldoret and Nakuru hospitals are both non-Government institutions and considerable numbers of patients are treated by private practitioners in nursing homes.

Of the foregoing totals 284 patients were officials as against 219 in 1925.

Six officials and 17 non-officials died as against 6 and 11 in the previous year.

The distribution of the various cases was as follows :—

				Officials.	Non-Officials.
Mombasa	...	...	...	60	151
Nairobi	...	...	...	169	482
Kisumu	...	...	...	55	78



Details with regard to the European Hospitals, considered separately, are as under :—

Hospital.	Type of Construction.	Staff.	No. of Beds.	Total In-Patients.	Average Daily Number.	Total Out-Patients. (Officials only).
European Hospital, Nairobi.	Stone—permanent buildings.	1 Senior Medical Officer. 1 Matron. 6 Nursing Sisters. 21 Africans.	30	627	19.96	86
European Hospital, Mombasa.	Stone—permanent buildings.	1 Senior Medical Officer. 4 Nursing Sisters. 12 Africans.	11	206	.65	128
European Hospital, Kisumu.	Wood and Iron—permanent building.	1 Medical Officer. 2 Nursing Sisters. 7 Africans.	6	126	2.36	50



### 3. NATIVE HOSPITALS AND DISPENSARIES.

The accommodation at the native hospitals has again been overtaxed; overcrowding is the rule everywhere. It has to be recorded with regret that no improvement has taken place either in the direction of providing increased accommodation or of replacing the insanitary mud and wattle structures which in some places, notably Fort Hall and Kakamega, constitute almost the whole of the hospital buildings. It is earnestly to be hoped that improvement will not long be delayed. Under present circumstances the best interests of the patients cannot be secured, and the long continuance of unsatisfactory conditions tends to dissatisfaction and loss of energy among the staff.

In Nairobi the proposal to erect at some future date a combined hospital has deferred improvements, and extra wards for which the steel work has arrived in the country are not yet erected. As a result there is no separate accommodation for maternity cases, and the ruinous buildings in use at the Infectious Diseases Hospital have not been replaced. The lack of separate accommodation for maternity cases at the Native Hospital is particularly disquieting. Cases are coming forward in increasing numbers, and it has to be remembered that of these the ordinary uncomplicated case is a rare exception. After, in many instances, extensive operative interference, the patients are nursed in the general ward, exposed to the risk of any infection which may be present and which cannot be eliminated where patients with every variety of complaint are congregated.

Minor repairs and improvements have been executed at hospitals where permanent or semi-permanent buildings exist. The erection of quarters for the European nursing sisters at the Nairobi Native Hospital was completed. The result is increased efficiency, both in the nursing of the patients and the training of the menial staff. The sisters are now available at all times for emergencies, and the arrangement of their duties does not require to coincide with the times at which transport can be provided to convey them to quarters situated as previously over two miles away. Lack of housing accommodation has rendered it impossible to extend the posting of European nursing sisters to other hospitals than those previously provided for.

The provision of new medical staff has produced an effect which was not foreseen when the extra help was asked for. It has been found possible to withdraw the sub-assistant surgeons previously posted to Nairobi and Kakamega hospitals; these are now available for other duties, e.g., it has been possible to re-open the sub-station at Kacheliba and to provide some medical facilities in this very unhealthy station.

The record of cases treated and deaths at the various native hospitals is as follows:—

			1926.		1925.		1924.	
			In.	Out.	In.	Out.	In.	Out.
Admissions	...	...	22,856	184,406	21,112	162,781	25,990	150,172
Deaths	...	...	1,064		900		786	
Death rate per 1,000								
of admissions	...		46.5		42.6		30.2	

No new native hospitals have been opened, though medical officers have been posted to districts which formerly were without medical assistance. The position is set forth in the section "Administration."

The money collected by the Native Councils has resulted in the erection of a better and more permanent type of dispensary in the Ukamba and Central Kavirondo Reserves, but the sums provided for the erection of hospital buildings in the Fort Hall and South Nyeri Reserves have not been expended. The money does not allow of the provision of a complete hospital, and therefore, in the case of Fort Hall, the matter is complicated by the future erection at a more suitable site of the new Government Hospital. No funds are provided for recurrent expenditure, and the immediate erection of the section provided for out of native funds would result in the existence for a time of two hospitals and the division of staff. Similar considerations arise in the case of South Nyeri, at present part of the district supposed to be served by the Fort Hall Hospital.

The site for a hospital in the Malindi District is still under consideration and cannot be settled till the all important water supply is found.

Comment has already been made as to the lack of properly trained native staff. The matter is one which affects the efficiency of almost every activity of the Department, and perhaps the native hospitals and dispensaries more than any other; in fact it may be stated that unless some more efficient type of dresser is forthcoming consideration must be paid to the question as to whether the continuance of the system of out-dispensaries merits the cost of maintenance.



The number of sub-dispensaries which were in operation during the year, under supervision from the various medical centres, was as follows:—

Fort Hall District (including South Nyeri and Embu)	...	9
Meru District	... ..	4
Machakos District	... ..	12
South Kavirondo	... ..	8
Central Kavirondo	... ..	11
North Kavirondo	... ..	11
Kisumu District	... ..	3
Digo District	... ..	3
Malindi District	... ..	3

The establishment of sub-dispensaries in the last quoted district results from the posting of a new medical officer.

The revised arrangements in force in Central Kavirondo have been described in the section devoted to syphilis.



Details with regard to the Native Hospitals, considered separately, are as under :—

Hospital.	Type of Construction.	Staff.	No. of Beds.	Total In-Patients.	Average Daily Number.	Total Out-Patients.
Native Hospital, Eldoret.	Brick, either iron or wood shingle roofs—round huts.	1 District Surgeon. 1 Sub-Assistant Surgeon. 9 Africans.	20 (approx.)	493	·35	3,641
Native Hospital, Fort Hall.	Permanent stone buildings, also temporary wattle and daub buildings.	2 Medical Officers. 1 Sub-Assistant Surgeon. 1 Native Clerk. 1 Native Laboratory Assistant. 38 Africans.	101 (approx.)	2,045	86	6,337
Native Hospital, Kakamega.	The Office and Operating Theatre are built with wood and iron; all other buildings, wattle and daub.	2 Medical Officers. 1 Asiatic Compounder. 1 Asiatic Clerk. 1 African Laboratory Assistant. 66 Africans.	98	882	125.24	2,122
Native Hospital, Kapsabet.	Round huts, wattle and daub with cement floors; Office and Dispensary, corrugated iron and wood.	1 Asiatic Compounder. 6 Africans. Supervised by Medical Officer, Kakamega.	20	307	—	3,749
Native Hospital, Kericho.	Wattle and daub—temporary buildings.	1 District Surgeon. 1 African Dresser.	6	60	—	633
Native Hospital, Kisumu.	Stone and iron—permanent buildings.	1 Senior Medical Officer. 1 Medical Officer. 2 Sub-Assistant Surgeons. 1 African Laboratory Assistant. 1 Compounder. 39 Africans.	118	1,873	91.02	20,505
Native Hospital, Kisii.	Stone—permanent buildings.	1 Medical Officer. 1 Sub-Assistant Surgeon. 1 Asiatic Clerk. 42 Africans.	45	1,016	72	10,142
Native Hospital, Kitui.	Wattle and daub—temporary buildings. A new hospital built of concrete with iron roofing is in course of construction.	1 Medical Officer. 1 Sub-Assistant Surgeon. 4 Africans.	8	196	—	6,093
Native Hospital, Lamu.	Stone—permanent building.	1 Sub-Assistant Surgeon. 7 Africans.	6	351	7.76	8,009
Native Hospital, Machakos.	Concrete buildings—permanent.	2 Medical Officers. 1 Sub-Assistant Surgeon. 1 Asiatic Clerk. 50 Africans.	44	940	54.56	4,782
Native Hospital, Malindi.	Stone; one ward of mud and wattle with an iron roof.	1 Sub-Assistant Surgeon in sub-medical charge. 1 Medical Officer is in charge of the district with headquarters at Kilifi. 12 Africans.	11 (approx.)	345	—	8,834
Native Hospital, Meru.	Wood, brick and iron, mud and wattle.	1 Medical Officer. 1 Sub-Assistant Surgeon. 13 Africans.	20 (approx.)	556	—	6,712
Native Hospital, Mombasa.	Permanent buildings, stone with iron roofs; three temporary wards, wattle and daub with iron roof.	1 Medical Officer. 2 Assistant Surgeons. 2 Sub-Assistant Surgeons. 1 Asiatic Compounder. 1 Native Laboratory Attendant. 55 Africans. 2 Nursing Sisters.	105 (approx.)	2,246	16.25	23,217
Native Hospital, Nairobi.	Wood and iron—temporary buildings.	1 Senior Medical Officer. 3 Medical Officers. 1 European Wardmaster. 1 European Nursing Orderly. 1 African Compounder. 4 Nursing Sisters. 71 Africans. 5 African Learners.	172 (approx.)	3,676	149	2,795
Infectious Diseases Hospital, Nairobi.	Concrete, wood and iron.	1 Medical Officer. 1 European Superintendent. 30 Africans.	110	546	—	—
Native Hospital, Nakuru.	Wood and iron—permanent buildings.	1 District Surgeon. 1 Sub-Assistant Surgeon. 14 Africans.	38	1,413	55	3,020
Native Hospital, Narok.	Wattle and daub—temporary building.	1 Medical Officer. 11 Africans.	10	50	—	645
Native Hospital, Nyeri.	Permanent wood and iron buildings; temporary wattle and daub buildings.	1 Sub-Assistant Surgeon. 4 Africans.	24 (approx.)	762	—	10,724
Native Hospital, Voi.	Corrugated iron and wood.	1 Sub-Assistant Surgeon. 8 Africans.	32	1,019	—	5,594







#### 4. MATHARI MENTAL HOSPITAL.

No extra accommodation for patients has been provided during the year and the institution cannot cope with the calls made upon it. Patients who would in the ordinary course of events be transferred to the Mental Hospital have to remain in the various Gaols which are gazetted asylums until accommodation is available. Considerable dissatisfaction naturally results.

No progress has been made with the proposed re-building, out of Loan Funds, of the Mental Hospital.

During the year much minor re-construction work has been carried out. Roughly about 5,100 feet of bamboo fencing has been constructed around the whole of the hospital, all existing airing courts have been enlarged and new bamboo fences have been erected round them.

Approximately 10 acres of ground have been cleared of timber and stumps ready to be used for the planting of foodstuffs at the next long rains.

The entrance to the Mental Hospital from the Fort Hall road has been re-constructed, the culverts have been repaired and the road reserve in front has been cleared ready to plant with flowers at the next rains.

All the fuel used during this year has been obtained from the hospital grounds.

Twelve acres have been prepared for wattle for the purposes of fuel in the future, this land having been found unsuitable for beans or maize owing to the nature of the soil being murrum.

A 360 gallon hot water tank has been erected, on a "thermos" system, which supplies hot water to the institution night or day, the fire only being needed for 6 hours out of the 24.

A new kitchen has been erected for the local staff quarters in the grounds.

New stores have been fitted up, and the stores removed from the Native block, thus providing further accommodation where it is most needed.

The whole of the fittings for the new European kitchen were done by direct labour.

All the above work was done by the patients of the hospital under European supervision.

The Public Works Department erected a new European kitchen during the year, thus providing a long felt want.

Six new lavatories have been erected, and altogether many yards of open drains have been laid.

The Native buildings have been improved as regards ventilation, and are now much more sanitary.

Patients have been encouraged to follow their own trades, and much useful repair work has been done which normally would have to be carried out by the Public Works Department.

#### GENERAL STATISTICS.

The following table shows the number of admissions and deaths during the last five years :—

	Admissions.					Deaths.				
	1922	1923	1924	1925	1926	1922	1923	1924	1925	1926
Males	67	69	70	86	89	35	10	15	30	32
Females	19	11	14	22	9	4	4	7	4	6
	86	80	84	108	98	39	14	22	34	38

During the year the total number of patients under treatment was 208, and the various forms of insanity for which the patients were admitted were :—

Mania	...	...	...	...	...	...	36
Dementia	...	...	...	...	...	...	22
Delusional Insanity	...	...	...	...	...	...	3
Epileptics and other Mental Diseases	...	...	...	...	...	...	37
Total	...	...	...	...	...	...	98



DEATHS. 38 deaths occurred, including 2 Europeans. The percentage of deaths to the total treated was 18.26. The percentage of deaths to the total admitted was 38.77. Deaths were due to a variety of causes. No epidemic occurred.

Septicaemia	...	...	...	...	...	2
Meningitis	...	...	...	...	...	1
Heart Failure	...	...	...	...	...	6
General Debility	...	...	...	...	...	17
Senile Decay	...	...	...	...	...	1
Epilepsy	...	...	...	...	...	6
Paranoia	...	...	...	...	...	1
Phthisis	...	...	...	...	...	2
Dementia	...	...	...	...	...	1
Malaria	...	...	...	...	...	1
Total ...						38

DISCHARGES. Seventy patients were discharged during the year, 63 males and 7 females.

REMAINING. One hundred patients remained under treatment at the end of the year, as against 110 at the end of 1925.

#### EUROPEAN SECTION.

Sixteen cases were treated during the year, an increase of four over the year 1925.

ADMISSIONS. Ten cases were admitted during the year—Males 8, and females 2. The cases were from :—

Nairobi	...	...	...	...	...	9
Nakuru	...	...	...	...	...	1
Total ...						10

DISCHARGES. Eight patients were discharged—male 7, female 1.

DEATHS. One case of senile dementia, who had been ill for some years, and one case of delusional insanity, also an old patient.

REMAINING. Males 3, females 3.

Two of the three males are permanently deranged and have little hope of recovery.

The three females are obviously incurable. One of these cases, owing to the nature of her complaint (manic depressive insanity) and owing to the unsuitability of the female European buildings, had to be removed and treated in one of the spare rooms in the unused end of the male European block. This case necessitated the employment of an additional nurse for purpose of observation both by day and night.

#### Recreation and Amusements.

Tennis is played if the condition of the patients allows. Indoor games are provided if required. There is a library to which additions are made from time to time from various sources.

#### Asiatic Section.

ADMISSIONS. Males 4, females 1.

DISCHARGES. Males 8, females nil.

REMAINING. Males 5, females 2.

DEATHS. Nil.

All of the Asiatics are treated in the Native building pending the provision of further accommodation.

#### Native Section.

One hundred and seventy-eight cases were treated during the year.

ADMISSIONS. Males 77, females 6.

DISCHARGES. Males 48, females 6.

DEATHS. Males 31, females 5.

REMAINING. Males 64, females 23.



AMUSEMENTS. Amusements are provided in the form of football on six nights a week; this is much enjoyed by the Natives and is undoubtedly a big step towards improvement of many.

DIET. From January 1st, 1926, a new and well considered scale has been issued, and the physical condition of all the Native patients is much improved in consequence.

### 5. GAOLS.

The malaria epidemic affected the inmates of the gaols as well as the rest of the community. The results are reflected in the statistics of sickness and deaths, the figures and especially those relating to deaths being very considerably higher than for years past. The comparative table is as follows:—

Year.		Daily average in prison.	Admissions to Hospital.	Daily average on sick list.	Percentage of total inmates.	Deaths.
1923	...	2,086	1,813	78.5	3.7	50
1924	...	2,282	1,758	82.7	3.6	50
1925	...	2,135	1,531	66.7	3.6	35
1926	...	2,242	2,296	79.8	3.6	76



For the three principal prisons the figures are:—

	Nairobi.					Mombasa.					Kisumu.				
	1923	1924	1925	1926	1923	1924	1925	1926	1923	1924	1925	1926			
Average daily number in gaol	794	865	650	777	286	339	264	242	201	232	358	295			
Average daily number on sick list	38.3	29.8	21.9	43.4	3.0	11.2	4.4	7.1	3.5	3.0	13.7	4.1			
Percentage of average daily sick to average number in gaol	4.8	3.4	3.4	5.6	1	3.3	1.7	2.9	1.5	1.3	3.8	1.4			
Total Deaths	35	35	11	38	1	3	4	4	1	3	10	7			
Percentage of deaths to average daily number in gaol	4.4	4.0	1.7	4.9	.3	.09	1.5	1.7	.5	1.3	2.8	2.4			



The deaths are classified as follows :—

				Nairobi Prison.	All Other Prisons.	Total.
Pneumonia	...	...	...	19	8	27
Dysentery	...	...	...	8	10	18
Other Diseases	...	...	...	11	17	28
				38	35	73

The number of deaths from malaria as a primary cause was not large, at Nairobi only three were recorded out of 679 admissions, but it is a fair inference that the effects of malaria had a considerable effect in the production of mortality from other diseases. The monthly statistics for the Nairobi Gaol tends to support such an assumption.

Generally, little improvement has taken place with regard to the accommodation provided and overcrowding is still the order of the day. At Nairobi two blocks of temporary buildings were erected accommodating 80 prisoners, but the space is still only 300 cubic feet per prisoner and 29 super feet.



## RETURNS.

TABLE I.

## ADMINISTRATIVE DIVISION.

Dr. J. L. Gilks	...	...	...	Director of Medical and Sanitary Services.
Dr. C. J. Wilson, M.C.	...	...	...	Deputy Director of Medical Service.
Dr. A. R. Paterson	...	...	...	Deputy Director of Sanitary Service.
Dr. A. D. J. B. Williams, O.B.E.	...	...	...	Senior Medical Officer.
Dr. F. J. C. Johnston	...	...	...	Senior Sanitation Officer.
Capt. J. S. Robertson, M.B.E.	...	...	...	Medical Storekeeper.
Mr. H. Ogden	...	...	...	Office Superintendent.
Mr. G. E. Scattergood	...	...	...	Accountant.
Mr. T. R. Wilson, D.C.M.	...	...	...	Clerk.
„ J. L. Byrne, M.C.	...	...	...	„
„ W. J. Ward	...	...	...	„
Miss M. E. Cameron	...	...	...	Stenographer.
Mr. R. L. O'Shea	...	...	...	„
Miss T. M. Raper	...	...	...	„
Miss J. M. C. Millett	...	...	...	„
Mrs. S. F. Stacey	...	...	...	„
Miss M. A. Corfe	...	...	...	„

## MEDICAL DIVISION.

	Dr. N. P. Jewell, M.C.	...	...	Senior Medical Officer.
	„ T. H. Massey, M.C.	...	...	„ „ „
	„ P. F. Nunan	...	...	„ „ „
	„ V. M. Fisher	...	...	„ „ „
	„ A. S. Mackie	...	...	Medical Officer.
	„ R. C. Briscoe	...	...	„ „
	„ C. V. Brainbridge	...	...	„ „
	„ K. T. K. Wallington	...	...	„ „
(1)	„ J. O. Bevan	...	...	„ „
	„ R. A. W. Procter, M.C.	...	...	„ „
	„ R. J. Harley Mason	...	...	„ „
	„ C. H. Brennan, M.C.	...	...	„ „
	„ J. A. Ross	...	...	„ „
	„ P. Milne	...	...	„ „
	„ F. R. L. Miller	...	...	„ „
	„ E. W. C. Jobson	...	...	„ „
	„ C. R. Philip	...	...	„ „
	„ W. Wilkinson	...	...	„ „
(2)	„ T. S. Cochrane	...	...	„ „
	„ J. R. Davies	...	...	„ „
	„ A. G. Thomson	...	...	„ „
	„ C. P. Donnison	...	...	„ „
	„ J. A. Carman	...	...	„ „
	„ D. Bell	...	...	„ „
	„ J. H. H. Chataway	...	...	„ „
	„ H. A. Cole	...	...	„ „
	„ R. McFiggans	...	...	„ „
	„ P. Ross	...	...	„ „
	„ A. A. Battson	...	...	„ „
	„ N. McLean	...	...	„ „
	„ G. S. Hale	...	...	„ „
	„ A. T. Howell	...	...	„ „
	„ F. L. Henderson	...	...	District Surgeon
	„ J. Forbes	...	...	„ „
	„ C. J. Caddick	...	...	„ „
	Mr. H. L. Sargent	...	...	Assistant Surgeon.
	„ W. N. Sargent	...	...	„ „
	„ A. H. Ball	...	...	Dispenser.
	„ F. E. Welch	...	...	„
	„ W. C. A. Skedge	...	...	„
	„ A. Lowe	...	...	Wardmaster.
	„ T. Johnston	...	...	Nursing Orderly.
	Miss E. B. Wishart	...	...	Matron.
	„ I. Wilson	...	...	Nursing Sister.
	Mrs. S. J. Harrison	...	...	„ „
	Miss A. E. Davis	...	...	„ „
	„ M. I. Rhind	...	...	„ „
	„ R. Anderson	...	...	„ „
	„ D. M. Kenny	...	...	„ „



Miss	F. M. Biggar	...	...	...	Nursing Sister.
	„ H. Baumann	...	...	...	„ „
(3)	„ C. Tilney	...	...	...	„ „
	„ M. Wallace	...	...	...	„ „
	„ R. F. Nimmo	...	...	...	„ „
	„ J. M. Pearson	...	...	...	„ „
	„ R. E. V. Nicholas	...	...	...	„ „
(4)	„ E. Johnson	...	...	...	„ „
	„ A. Hagan	...	...	...	„ „
(5)	„ A. Cockman	...	...	...	„ „
	„ C. E. Eason	...	...	...	„ „
	„ E. M. Birch	...	...	...	„ „
	„ E. T. Rogers	...	...	...	„ „
	„ M. E. Roche	...	...	...	„ „
	„ B. A. Robertson	...	...	...	„ „
	„ M. C. Rice-Oxley	...	...	...	„ „
	„ I. M. Nicholson	...	...	...	„ „
	„ P. K. Dutton	...	...	...	„ „
	„ S. I. Beazley	...	...	...	„ „
	„ M. S. Neville	...	...	...	„ „
	„ M. McLeod	...	...	...	„ „
	„ C. S. Irvine-Robertson	...	...	...	„ „
Mr.	W. G. Howe	...	...	...	Supt., Mental Hospital.
Mrs.	A. T. Howe	...	...	...	Matron, „ „
Mrs.	G. Bowering	...	...	...	Asst. Matron, Mental Hospital.
Mr.	S. J. Bosch	...	...	...	Warder, Mental Hospital.
	„ F. J. B. Jordan	...	...	...	„ „ „

## SANITATION DIVISION.

Dr.	H. S. de Boer, M.C.	...	...	Senior Sanitation Officer.
„	R. M. Hunter	...	...	„ „ „
„	J. MacP. Campbell	...	...	Sanitation Officer.
„	P. C. C. Garnham	...	...	„ „ „
„	K. A. T. Martin	...	...	„ „
„	J. R. Tibbles	...	...	„ „
„	W. J. Hutchinson	...	...	„ „
Mr.	J. P. Cook	...	...	Senior Sanitary Inspector.
„	A. P. Ling	...	...	„ „ „
„	D. P. Broad	...	...	Sanitary Inspector.
„	A. Bunker	...	...	„ „
„	R. C. Mills	...	...	„ „
„	H. E. Taylor	...	...	„ „
„	F. Hewitt	...	...	„ „
„	H. O. Salt	...	...	„ „
„	S. M. Jackson	...	...	„ „
„	A. C. Arnold	...	...	„ „
„	H. Martin	...	...	„ „
„	R. W. Robinson	...	...	„ „
„	H. H. Rodgers	...	...	„ „
„	D. Mackintosh	...	...	„ „
„	C. A. Lewis	...	...	„ „
„	Trevor Hughes	...	...	„ „
„	G. E. Shaw	...	...	Sanitary Overseer.
Miss	R. K. Sharp	...	...	Nursing Sister.
„	M. A. Perkin	...	...	„ „
„	E. A. M. Riordan	...	...	„ „
„	M. E. Mindham	...	...	„ „
Mr.	W. J. Henfrey	...	...	Supt., Infectious Diseases Hospital.

## LABORATORY DIVISION.

Dr.	W. H. Kauntze, M.B.E.	...	Director of Laboratory.
„	G. V. Allen	...	Senior Bacteriologist.
„	J. C. J. Callanan	...	Asst. Bacteriologist.
„	F. G. P. de Smidt	...	„ „
Mr.	W. C. Birch	...	Government Analyst.
Dr.	F. C. Kelly	...	Chemical Officer.
Mr.	C. B. Symes	...	Entomologist.
„	F. A. Bailey	...	Laboratory Assistant.
„	J. A. Bell	...	„ „
„	J. S. McDonald	...	„ „
„	H. M. Nefdt	...	„ „
„	R. Brunsdan	...	„ „ (Learner).
„	E. W. Grainger	...	„ „
„	T. Jones	...	„ „



- (1) Invalided 31.12.26.
- (2) Resigned 1.8.26.
- (3) Transferred to Federated Malay States,  
Colonial Office Kenya 999 dated 19.10.26.
- (4) Resigned 21.9.26.
- (5) Resigned 6.8.26.

**TABLE II.****FINANCIAL.**

The sanctioned Medical Budget for the year 1926 was a total of £179,964, as compared with £134,406 for the preceding 12 months.

Of the 1926 grand total £160,654 was expended leaving an unexpended sum of £19,310.

The headings under which the vote was arranged were as follows :—

**MEDICAL DEPARTMENT.****ADMINISTRATIVE DIVISION.**

	Estimates.	Actual Expenditure.
	£	£
Personal Emoluments ... ..	15,174	13,707

**MEDICAL DIVISION.**

Personal Emoluments ... ..	58,400	54,811
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**SANITATION DIVISION.**

Personal Emoluments ... ..	21,715	15,494
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**LABORATORY DIVISION.**

Personal Emoluments ... ..	10,125	8,563
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**MEDICAL DEPARTMENT.**

Other Charges ... ..	73,550	68,079
Special Expenditure Leper Lazarette ...	1,000	Nil.

**REVENUE.**

The total amount of revenue collected as hospital fees, sales of medicines and surgical stores, bills of health and registration fees, was as follows :—

	£	£
Hospital fees, sales of medicines and registration fees ...	8,803	
Bills of Health ... ..	595	
Laboratory Fees ... ..	786	10,184
Re-imburement from Uganda Government on account of Zanzibar Sanitary Station ... ..	425	
Re-imburement from Kenya and Uganda Railway on account of medical and dental services ... ..	7,572	7,997
		18,181

Last year the total revenue collected amounted to £16,240.

**TABLE III.****RETURN OF STATISTICS OF POPULATION FOR THE YEAR 1926.**

Colony and Protectorate of Kenya.	Europeans and Whites.	Africans and Others.	Asiatics.
Number of inhabitants in 1926 ... ..	12,529*	2,515,330†	26,759*
Number of births registered in 1926 ...	Figures not available.		
Number of deaths registered in 1926 ...	Figures not available.		
Number of Immigrants during 1926 ...	6,058	3,352	10,727
Number of Emigrants during 1926 ...	Figures not available.		
Number of inhabitants in 1926 ... ..	12,529	2,515,330	26,759

\* 1926 Census.

† Estimated.



TABLE V.

METEOROLOGICAL RETURN FOR THE YEAR 1926.

## NAIROBI.

Month.		Temperature.					Rainfall.		Winds.		Remarks.
		Solar Maximum.	Maximum on Grass.	Shade Maximum.	Range.	Max. and Min. mean combined.	Shade Minimum.	Amount in Inches.	Degree of humidity.	General Direction.	
			Deg.		Deg.	Deg.		%			
January	...	No Observations.	34	—	75.5	57	0.05	67	N.E.	2.5	
February	...		85	—	71.0	57	1.02	69	N.E.	2.3	
March	...		84	—	71.5	59	5.97	71	N.E.	2.0	
April	...		80	—	70.0	60	7.12	82	N.E.	1.6	
May	...		76	—	66.5	57	4.45	82	N.E.	1.4	
June	...		74	—	64.0	54	1.42	80	N.E.	1.3	
July	...		72	—	62.5	53	0.95	82	N.E.	1.3	
August	...		74	—	62.5	51	1.10	82	N.E.	1.3	
September	...		80	—	67.0	54	2.62	71	N.E.	1.5	
October	...		80	—	68.0	56	2.93	77	N.E.	1.6	
November	...		77	—	67.0	57	3.77	79	N.E.	1.5	
December	...		79	—	65.0	51	0.75	72	N.E.	2.2	
Year Average.			79	—	67.5	56	32.15	75	N.E.	1.7	

## MOMBASA.

Month.		Temperature.					Rainfall.	Winds.		Remarks.	
		Solar Maximum.	Maximum on Grass.	Shade Maximum.	Range.	Max. and Min. mean combined.	Shade Minimum.	Amount in Inches.	Degree of humidity.		General Direction.
			Deg.		Deg.	Deg.		%			
January	...	No Observations.	No Observations.	83	—	72.5	62	0.00	68	No Observations.	No Observations.
February	...			83	—	73.0	62	0.25	68		
March	...			91	—	78.0	65	4.44	78		
April	...			88	—	76.0	64	4.09	81		
May	...			84	—	72.5	61	7.24	86		
June	...			83	—	70.5	58	5.88	79		
July	...			82	—	70.0	58	4.01	81		
August	...			83	—	70.0	57	2.38	90		
September	...			85	—	71.5	58	9.61	81		
October	...			—	—	—	—	0.76	79		
November	...			88	—	—	—	3.64	77		
December	...			84	—	80.0	76	0.75	76		
Year Average.				85	—	73.5	62	43.05	79		



TABLE V.—(Contd).

METEOROLOGICAL RETURN FOR THE YEAR 1926.

FORT-HALL.

Month.		Temperature.					Rainfall.		Winds.		Remarks.
		Solar Maximum.	Maximum on Grass.	Shade Maximum.	Range.	Max. and Min. mean combined.	Shade Minimum.	Amount in Inches.	Degree of humidity.	General Direction.	
			Deg.		Deg.	Deg.		%			
January	...	No Observations.	81	—	63.5	56	0.45	76	No Observations.	No Observations.	
February	...		82	—	68.5	55	1.29	70			
March	...		82	—	68.5	55	5.43	70			
April	...		79	—	67.0	55	16.21	77			
May	...		79	—	67.5	56	8.07	77			
June	...		79	—	67.5	56	0.79	89			
July	...		78	—	66.5	55	0.47	96			
August	...		78	—	66.0	54	0.76	96			
September	...		80	—	66.5	53	2.77	74			
October	...		80	—	66.5	53	2.63	66			
November	...		80	—	66.5	53	10.59	69			
December	...		80	—	67.0	54	2.81	69			
Year Average.			80	—	67.0	54	52.27	78			

KISUMU.

Month.	Temperature.					Rainfall.		Winds.		Remarks.
	Solar Maximum.	Maximum on Grass.	Shade Maximum.	Range.	Max. and Min. mean combined.	Shade Minimum.	Amount in Inches.	Degree of humidity.	General Direction.	
January	...						0.27			
February	...						4.31			
March	...						5.61			
April	...						9.80			
May	...	INCOMPLETE OBSERVATIONS					13.13			
June	...						0.24			
July	...	DURING 1926.					1.42			
August	...						2.37			
September	...						6.97			
October	...						1.05			
November	...						3.17			
December	...						1.05			
Year Average.							49.49			



**TABLE V.—(Contd).**

TABLE SHOWING MEAN ANNUAL RAINFALL AT VARIOUS POINTS  
IN THE DIFFERENT AREAS FOR THE YEAR 1926.

COAST AREA.							
STATION.							1926.
Malindi.	...	...	...	...	...	...	59.37
Mombasa	...	...	...	...	...	...	43.05
Mazeras	...	...	...	...	...	...	18.01
Mackinnon Road	...	...	...	...	...	...	25.84
Voi	...	...	...	...	...	...	6.34
Taveta	...	...	...	...	...	...	29.02

## MOUNTAINOUS AREA.

Masongaleni	...	...	...	...	...	...	19.14
Makindu	...	...	...	...	...	...	15.78
Kiu	...	...	...	...	...	...	24.75
Athi River	...	...	...	...	...	...	25.68
Nairobi (Department of Agriculture)				...	...	...	32.15
Kabete Reformatory (near Nairobi)				...	...	...	45.24
Naivasha	...	...	...	...	...	...	28.29
Nakuru	...	...	...	...	...	...	38.76
Molo	...	...	...	...	...	...	53.22
Eldama Ravine	...	...	...	...	...	...	56.82

NYANZA AND KENYA PROVINCE.

Lumbwa	...	...	...	...	...	...	...
Muhroni	...	...	...	...	...	...	...
Kisumu	...	...	...	...	...	...	...
Mumias (Kakamega)			...	...	...	...	...
Kericho	...	...	...	...	...	...	...
Nandi	...	...	...	...	...	...	...
Fort Hall	...	...	...	...	...	...	...
Nyeri	...	...	...	...	...	...	...
West Kenya	...	...	...	...	...	...	...



TABLE VI.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926.

				EUROPEAN OFFICIALS.				GENERAL EUROPEAN POPULATION.					
DISEASES.				Remaining in Hos- pital at end of 1925.	Yearly Total.		Total cases treated.	Remaining in Hos- pital at end of 1926.	Remaining in Hos- pital at end of 1925.	Yearly Total.		Total cases treated.	Remaining in Hos- pital at end of 1926.
					Admissions.	Deaths.				Admissions.	Deaths.		
<b>INFECTIVE DISEASES:</b>													
Beri-beri	...	...	...	—	—	—	—	—	—	—	—	—	—
Cerebro-spinal Fever	...	...	...	—	—	—	—	—	—	—	—	—	—
Chicken-pox	...	...	...	—	2	—	2	—	—	I	—	I	—
Cholera	...	...	...	—	—	—	—	—	—	—	—	—	—
Dengue	...	...	...	—	2	—	2	—	—	—	—	—	—
Diphtheria	...	...	...	—	—	—	—	—	—	—	—	—	—
Dysentery	...	...	...	—	16	—	16	I	I	27	I	28	—
Endocarditis-Infective	...	...	...	—	—	—	—	—	—	—	—	—	—
Enteric	...	...	...	—	3	—	3	2	—	5	—	5	I
Erysipelas	...	...	...	—	—	—	—	—	—	I	—	I	—
Gonorrhoea	...	...	...	—	3	—	3	—	—	—	—	—	—
Influenza	...	...	...	6	173	—	179	—	I	67	—	68	—
Kala Azar	...	...	...	—	—	—	—	—	—	—	—	—	—
Leprosy—													
(a) Nodular	...	...	...	—	—	—	—	—	—	—	—	—	—
(b) Anaesthetic	...	...	...	—	—	—	—	—	—	—	—	—	—
Malaria—													
(a) Sub-Tertian	...	...	...	—	209	I	209	—	I	95	—	96	2
(b) Benign Tertian	...	...	...	—	2	—	2	—	—	II	—	II	—
(c) Quartan	...	...	...	—	I	—	I	—	—	—	—	—	—
(d) Undifferentiated	...	2	258	—	—	—	260	7	—	III	—	III	—
(e) Black-water	...	I	6	2	—	—	7	—	—	12	4	12	—
Measles	...	...	...	—	3	—	3	—	—	2	—	2	—
Malta Fever	...	...	...	—	—	—	—	—	—	—	—	—	—
Plague	...	...	...	—	—	—	—	—	—	—	—	—	—
Pneumonia	...	...	...	I	4	—	5	—	—	8	I	8	—
Rabies	...	...	...	—	—	—	—	—	—	—	—	—	—
Relapsing Fever	...	...	...	—	—	—	—	—	—	—	—	—	—
Rheumatic Fever	...	...	...	—	4	—	4	—	—	I	—	—	I
Septicaemia	...	...	...	—	—	—	—	—	—	—	—	—	—
Trypanosomiasis (Sleeping Sickness)	...	...	...	—	—	—	—	—	—	—	—	—	—
Small-pox	...	...	...	—	—	—	—	—	—	—	—	—	—
Syphilis—													
(a) Primary	...	...	...	—	—	—	—	—	—	I	—	I	—
(b) Secondary	...	...	...	—	—	—	—	—	—	—	—	—	—
(c) Inherited	...	...	...	—	—	—	—	—	—	—	—	—	—
Tetanus	...	...	...	—	—	—	—	—	—	—	—	—	—
Tuberculosis	...	...	...	—	2	—	2	—	—	3	—	3	—



TABLE VI.—Continued.

## RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926.

DISEASES.	EUROPEAN OFFICIALS.				GENERAL EUROPEAN POPULATION.								
	Remaining in Hos- pital at end of 1925.	Yearly Total.	Deaths.	Total cases treated.	Remaining in Hos- pital at end of 1926.	Remaining in Hos- pital at end of 1925.	Yearly Total.	Deaths.		Total cases treated.	Remaining in Hos- pital at end of 1926.		
GENERAL DISEASES.—(Contd.)													
Hodgkin's Disease	...	...	—	—	—	—	—	—	—	—	—		
Myxoedema	...	...	—	—	—	—	—	—	—	—	—		
Purpura	...	...	...	—	—	—	—	—	—	—	—		
Rickets	...	...	...	—	—	—	—	—	—	—	—		
Scurvy	...	...	...	—	—	—	—	—	—	—	—		
Other General Diseases	...	...	—	23	—	23	—	1	13	—	14	1	
LOCAL DISEASES.													
Diseases of the Nervous System.													
Sub-Section 1.													
Neuritis	...	...	...	—	1	—	1	—	—	11	—	11	—
Meningitis	...	...	...	—	—	—	—	—	—	1	1	1	—
Myelitis	...	...	...	—	—	—	—	—	—	—	—	—	—
Hydrocephalus	...	...	...	—	—	—	—	—	—	—	—	—	—
Encephalitis	...	...	...	—	—	—	—	—	—	—	—	—	—
Abscess of Brain	...	...	...	—	—	—	—	—	—	—	—	—	—
Congestion of Brain	...	...	...	—	—	—	—	—	—	—	—	—	—
Other Diseases	...	...	—	3	—	3	1	—	8	1	8	—	—
Sub-Section 2.													
Apoplexy.	...	...	...	—	—	—	—	—	—	—	—	—	—
Paralysis	...	...	...	—	—	—	—	—	—	—	—	—	—
Chorea	...	...	...	—	—	—	—	—	—	—	—	—	—
Epilepsy	...	...	...	—	1	—	1	—	—	—	—	—	—
Neuralgia	...	...	...	—	14	—	14	—	—	4	—	4	—
Hysteria	...	...	...	—	—	—	—	—	—	—	—	—	—
Other Nervous Diseases	...	...	—	4	—	4	—	1	4	—	5	1	—
Mental Diseases.													
Sub-Section 3.													
Idiocy	...	...	...	—	—	—	—	—	1	—	1	—	—
Mania	...	...	...	—	—	—	—	—	3	—	3	1	—
Melancholia	...	...	...	—	—	—	—	—	—	—	—	—	—
Dementia	...	...	...	—	—	—	—	3	2	1	5	3	—
Delusional Insanity	...	...	...	—	—	—	—	—	—	—	—	—	—
Other Mental Diseases	...	...	—	2	—	2	—	3	5	1	8	2	—
Diseases of the Eye.													
Conjunctivitis	...	...	...	—	4	—	4	—	1	—	1	—	—
Keratitis	...	...	...	—	—	—	—	—	—	—	—	—	—
Ulceration of Cornea	...	...	...	—	—	—	—	—	—	—	—	—	—
Iritis	...	...	...	—	—	—	—	—	2	—	2	—	—
Optic Neuritis	...	...	...	—	—	—	—	—	—	—	—	—	—
Cataract	...	...	...	—	—	—	—	—	—	—	—	—	—
Other Eye Diseases	...	...	1	6	—	7	—	—	2	—	2	—	—
Diseases of Ear.													
Inflammation	...	...	...	—	—	—	—	—	—	—	—	—	—
Other Diseases	...	...	...	—	2	—	2	—	2	—	2	—	—
Diseases of Nose.													
Diseases of the Circulatory System.													
Pericarditis	...	...	...	—	—	—	—	—	4	2	4	—	—
Endocarditis	...	...	...	—	—	—	—	—	—	—	—	—	—
Valvular Mitral	...	...	...	—	1	—	1	—	—	—	—	—	—
Valvular Aortic	...	...	...	—	—	—	—	—	—	—	—	—	—
Valvular Tricuspid	...	...	...	—	—	—	—	—	—	—	—	—	—
Valvular Pulmonary	...	...	...	—	—	—	—	—	—	—	—	—	—
Arterial Sclerosis	...	...	...	—	—	—	—	—	—	—	—	—	—
Aneurism	...	...	...	—	—	—	—	—	—	—	—	—	—
Other Diseases	...	...	...	—	1	—	1	—	7	1	7	1	—
Diseases of the Respiratory System.													
Laryngitis	...	...	...	—	3	—	3	—	4	—	4	—	—
Bronchitis	...	...	...	—	26	—	26	1	12	—	12	—	—



**TABLE VI.**—Continued.

### RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926.

DISEASES.				EUROPEAN OFFICIALS.				GENERAL EUROPEAN POPULATION.				
				Remaining in Hos- pital at end of 1925.	Yearly Total.		Total cases treated.	Remaining in Hos- pital at end of 1926.	Remaining in Hos- pital at end of 1925.	Yearly Total.		Total cases treated.
				Admissions.	Deaths.			Admissions.	Deaths.			
LOCAL DISEASES.—(Contd.)]												
Broncho-Pneumonia	...	...	—	2	1	2	—	—	1	—	1	—
Abscess of Lung	...	...	—	—	—	—	—	—	—	—	—	—
Gangrene of Lung	...	...	—	—	—	—	—	—	—	—	—	—
Emphysema	...	...	—	—	—	—	—	—	—	—	—	—
Pleurisy	...	...	—	1	—	1	—	—	2	—	2	—
Empyema	...	...	—	—	—	—	—	—	—	—	—	—
Other Diseases	...	...	1	9	1	10	—	—	19	—	19	2
Diseases of the Digestive System.												
Stomatitis	...	...	—	—	—	—	—	—	—	—	—	—
Caries of Teeth	...	...	—	6	—	6	—	—	4	—	4	—
Glossitis	...	...	—	—	—	—	—	—	—	—	—	—
Sore Throat	...	...	—	7	—	7	—	—	—	—	—	—
Inflammation of Tonsils	...	...	3	27	—	30	—	1	29	—	30	—
Gastritis	...	...	3	27	—	30	1	—	6	—	6	—
Ulceration of Stomach	...	...	—	—	—	—	—	—	2	—	2	—
Haematemesis	...	...	—	1	—	1	—	—	—	—	—	—
Dilatation of Stomach	...	...	—	—	—	—	—	—	2	—	2	—
Stricture of Stomach	...	...	—	—	—	—	—	—	—	—	—	—
Dyspepsia	...	...	—	4	—	4	—	—	1	—	1	—
Enteritis	...	...	—	8	—	8	—	—	7	—	7	—
Appendicitis	...	...	—	5	—	5	—	1	46	—	47	—
Colitis	...	...	—	5	—	5	—	—	12	—	12	1
Ulceration of Intestines	...	...	—	—	—	—	—	—	—	—	—	—
Sprue	...	...	—	—	—	—	—	—	—	—	—	—
Hernia	...	...	—	3	—	3	—	—	7	—	7	—
Diarrhoea	...	...	—	29	—	29	—	—	19	—	19	—
Constipation	...	...	—	4	—	4	—	—	5	—	5	—
Colic	...	...	—	24	—	24	1	—	14	—	14	—
Haemorrhoids	...	...	—	9	—	9	—	—	6	—	6	—
Pancreatitis	...	...	—	—	—	—	—	—	—	—	—	—
Hepatitis (Acute)	...	...	—	6	—	6	—	—	2	—	2	—
Abscess	...	...	—	1	—	1	—	—	1	—	1	—
Cirrhosis	...	...	—	—	—	—	—	—	—	—	—	—
Jaundice	...	...	—	—	—	—	—	—	2	—	2	—
Peritonitis	...	...	—	1	1	1	—	—	—	—	—	—
Ascites	...	...	—	—	—	—	—	—	—	—	—	—
Other Diseases	...	...	—	5	—	5	—	1	32	1	33	—
Diseases of the Lymphatic System.												
Splenitis	...	...	—	—	—	—	—	—	1	—	1	—
Inflammation of Lymphatic Gland.	...	...	—	1	—	1	—	—	1	—	1	—
Suppuration of Lymphatic Gland.	...	...	—	—	—	—	—	—	—	—	—	—
Lymphangitis	...	...	—	—	—	—	—	—	—	—	—	—
Elephantiasis	...	...	—	—	—	—	—	—	—	—	—	—
Other Diseases	...	...	—	1	—	1	—	—	2	—	2	—
Diseases of the Urinary System.												
Acute Nephritis	...	...	—	2	—	2	—	—	2	—	2	—
Bright's Disease	...	...	—	—	—	—	—	—	—	—	—	—
Pyelitis	...	...	—	—	—	—	—	—	1	—	1	—
Calculus	...	...	—	—	—	—	—	—	—	—	—	—
Renal Colic	...	...	—	3	—	3	—	—	1	—	1	—
Cystitis	...	...	—	5	—	5	—	—	5	—	5	—
Vesical Calculus	...	...	—	—	—	—	—	—	—	—	—	—
Suppression	...	...	—	—	—	—	—	—	—	—	—	—
Haematuria	...	...	—	3	—	3	1	—	5	1	5	—
Chyluria	...	...	—	—	—	—	—	—	2	—	2	—
Other Diseases	...	...	—	1	—	1	—	—	3	1	3	—
Diseases of the Generative System.												
Male Organs.												
Urethritis	...	...	—	—	—	—	—	—	—	—	—	—



TABLE VI.—Continued.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926.

DISEASES.	EUROPEAN OFFICIALS.				GENERAL EUROPEAN POPULATION.							
	Remaining in Hos- pital at end of 1925.	Yearly Total.		Total cases treated.	Remaining in Hos- pital at end of 1926.	Remaining in Hos- pital at end of 1925.	Yearly Total.		Total cases treated.	Remaining in Hos- pital at end of 1926.		
		Admissions.	Deaths.				Admissions.	Deaths.				
LOCAL DISEASES.—(Contd.)												
Gleet	...	...	...	—	—	—	—	—	—	—	—	—
Stricture	...	...	...	—	—	—	—	—	—	—	—	—
Prostatitis	...	...	...	—	—	—	—	—	—	—	—	—
Soft Chancre	...	...	...	—	—	—	—	—	—	—	—	—
Condyloma	...	...	...	—	—	—	—	—	—	—	—	—
Inflammation of Scrotum	...	...	...	—	—	—	—	—	—	—	—	—
Hydrocele	...	...	...	—	4	—	4	—	2	—	2	—
Orchitis	...	...	...	—	1	—	1	—	1	—	1	—
Epididymitis	...	...	...	—	1	—	1	—	—	—	—	—
Abscess of Testicle	...	...	...	—	—	—	—	—	—	—	—	—
Other Diseases	...	...	...	—	1	—	1	—	6	—	6	—
Female Organs.												
Ovaritis	...	...	...	—	—	—	—	—	—	—	—	—
Ovarian Cyst	...	...	...	—	—	—	—	—	4	—	4	—
Displacement of Uterus	...	...	...	—	—	—	—	—	4	—	4	—
Vaginitis	...	...	...	—	—	—	—	—	—	—	—	—
Amenorrhoea	...	...	...	—	—	—	—	—	—	—	—	—
Dysmenorrhoea	...	...	...	—	—	—	—	—	5	—	5	—
Menorrhagia	...	...	...	—	1	—	1	—	2	—	2	—
Leucorrhoea	...	...	...	—	—	—	—	—	—	—	—	—
Abortion	...	...	...	—	—	—	—	—	7	—	7	—
Delayed Labour	...	...	...	—	—	—	—	—	1	—	1	—
Post-partum Haemorrhage	...	...	...	—	—	—	—	—	—	—	—	—
Retained Placenta	...	...	...	—	—	—	—	—	—	—	—	—
Premature Birth	...	...	...	—	—	—	—	—	—	—	—	—
Puerperal Septicaemia	...	...	...	—	—	—	—	—	—	—	—	—
Mastitis	...	...	...	—	—	—	—	—	—	—	—	—
Abscess of Breast	...	...	...	—	—	—	—	—	1	—	1	—
Other Diseases	...	...	...	—	—	—	—	1	20	—	21	—
Diseases of the Organs of Locomotion.												
Osteitis	...	...	...	—	—	—	—	1	—	—	1	—
Arthritis	...	...	...	—	1	—	1	—	—	—	—	—
Spondylitis	...	...	...	—	—	—	—	—	—	—	—	—
Bursitis	...	...	...	—	—	—	—	—	—	—	—	—
Other Diseases	...	...	...	—	29	—	29	—	15	—	15	—
Diseases of the Connective Tissue.												
Cellulitis	...	...	...	—	4	—	4	1	5	—	5	—
Abscess	...	...	...	—	8	—	8	—	18	—	18	—
Elephantiasis	...	...	...	—	—	—	—	—	—	—	—	—
Other Diseases	...	...	...	—	8	—	8	—	11	—	11	—
Diseases of the Skin.												
Urticaria	...	...	...	—	3	—	3	—	3	—	3	—
Eczema	...	...	...	—	3	—	3	—	2	—	2	—
Boil	...	...	...	—	8	—	8	1	3	—	3	—
Carbuncle	...	...	...	—	—	—	—	—	2	—	2	—
Herpes	...	...	...	—	—	—	—	—	—	—	—	—
Psoriasis	...	...	...	—	—	—	—	—	—	—	—	—
Oriental Sore	...	...	...	—	—	—	—	—	—	—	—	—
Tinea	...	...	...	—	—	—	—	—	—	—	—	—
Scabies	...	...	...	—	—	—	—	—	—	—	—	—
Acne	...	...	...	—	—	—	—	—	—	—	—	—
Prickly Heat	...	...	...	—	9	—	9	—	—	—	—	—
Other Diseases	...	...	...	—	—	—	—	2	13	—	15	1
Injuries—General	...	...	...	—	2	—	2	—	—	—	—	—
Local	...	...	...	5	121	—	126	2	6	81	2	87
*Surgical Operations	...	...	...	—	(87)	—	—	—	—	(236)	—	—
Tumours	...	...	...	—	—	—	—	—	6	—	6	—
Malformations	...	...	...	—	—	—	—	—	2	—	2	1

\*Recorded under respective diseases.



TABLE VI.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926.

DISEASES.	EUROPEAN OFFICIALS.				GENERAL EUROPEAN POPULATION.							
	Remaining in Hos- pital at end of 1925.	Yearly Total.		Total cases treated.	Remaining in Hos- pital at end of 1926.	Remaining in Hos- pital at end of 1925.	Yearly Total.		Total cases treated.	Remaining in Hos- pital at end of 1926.		
		Admissions.	Deaths.				Admissions.	Deaths.				
LOCAL DISEASES.—(Contd.)												
Poisons ...	...	...	—	1	—	1	—	—	2	—	2	—
Parasites—Animal ...	...	...	—	—	—	—	—	—	1	—	1	—
Protozoa ...	...	...	—	—	—	—	—	—	—	—	—	—
Trematoda (Flukes) ...	...	...	—	—	—	—	—	—	—	—	—	—
Cestoda—												
Taenia Solium ...	...	...	—	1	—	1	—	1	2	—	3	—
Taenia Saginata ...	...	...	—	—	—	—	—	—	—	—	—	—
Nematoda—												
Ascaris ...	...	...	—	—	—	—	—	—	1	—	1	—
Tricocephalus Dispar ...	...	...	—	—	—	—	—	—	—	—	—	—
Trichina ...	...	...	—	—	—	—	—	—	—	—	—	—
Dracunculus ...	...	...	—	—	—	—	—	—	—	—	—	—
Filariasis ...	...	...	—	—	—	—	—	—	—	—	—	—
Strongylus ...	...	...	—	—	—	—	—	—	—	—	—	—
Ankylostomiasis ...	...	...	—	—	—	—	—	—	—	—	—	—
Oxyuris ...	...	...	—	—	—	—	—	—	—	—	—	—
Insecta—												
Myiasis ...	...	...	—	—	—	—	—	—	—	—	—	—
Other Diseases ...	...	...	—	1	—	1	—	—	—	—	—	—
TOTAL.	...	23	1,199	6	1,222	19	26	914	18	940	26	



TABLE VI.—Continued.

## RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926.

DISEASES.				NON-EUROPEAN OFFICIALS.					GENERAL NATIVE POPULATION.				
				Remaining in Hos- pital at end of 1925.	Yearly Total. Admissions.	Deaths.	Total cases treated.	Remaining in Hos- pital at end of 1926.	Remaining in Hos- pital at end of 1925.	Yearly Total. Admissions.	Deaths.	Total cases treated.	Remaining in Hos- pital at end of 1926.
INFECTIVE DISEASES:													
Beri-beri	...	...	...	—	—	—	—	—	5	12	3	17	—
Cerebro-spinal Fever	...	...	...	—	—	—	—	—	2	37	22	39	—
Chicken-pox	...	...	...	—	1	—	1	—	29	263	—	292	17
Cholera	...	...	...	—	—	—	—	—	—	—	—	—	—
Dengue	...	...	...	—	—	—	—	—	—	—	—	4	—
Diphtheria	...	...	...	—	—	—	—	—	—	3	1	3	—
Dysentery	...	...	...	1	40	—	41	—	19	380	64	397	16
Endocarditis-Infective	...	...	...	—	—	—	—	—	—	—	—	—	—
Enteric	...	...	...	—	1	1	1	—	2	47	6	49	7
Erysipelas	...	...	...	—	—	—	—	—	—	1	—	1	—
Gonorrhoea	...	...	...	1	2	—	3	—	21	372	3	393	38
Influenza	...	...	...	12	509	—	521	5	34	557	6	591	6
Kala Azar	...	...	...	—	—	—	—	—	—	1	—	1	—
Leprosy—													
(a) Nodular	...	...	...	—	—	—	—	—	—	81	3	81	—
(b) Anaesthetic	...	...	...	—	—	—	—	—	240	47	1	287	233
Malaria—													
(a) Sub-Tertian	...	...	...	6	705	—	711	6	10	2,962	118	2,972	51
(b) Benign Tertian	...	...	...	—	1	—	1	—	1	202	4	203	3
(c) Quartan	...	...	...	—	—	—	—	—	3	38	1	41	—
(d) Undifferentiated	...	...	...	21	2,230	—	2,251	15	68	3,316	33	3,384	44
(e) Black-water	...	...	...	—	8	—	8	—	—	23	10	23	—
Measles	...	...	...	—	1	—	1	—	1	159	—	160	19
Malta Fever	...	...	...	—	—	—	—	—	1	3	1	4	1
Plague	...	...	...	—	—	—	—	—	—	78	44	78	2
Pneumonia	...	...	...	—	14	—	14	—	26	1,051	253	1,077	28
Rabies	...	...	...	—	—	—	—	—	—	1	1	1	—
Relapsing Fever	...	...	...	—	—	—	—	—	2	181	6	183	5
Rheumatic Fever	...	...	...	—	—	—	—	—	1	19	1	20	1
Septicaemia	...	...	...	—	—	—	—	—	—	19	18	19	1
Trypanosomiasis (Sleeping Sickness)	...	...	...	—	—	—	—	—	2	27	1	29	1
Small-pox	...	...	...	—	—	—	—	—	7	—	—	7	—
Syphilis—													
(a) Primary	...	...	...	—	2	—	2	—	17	430	—	447	43
(b) Secondary	...	...	...	—	—	—	—	—	29	369	12	398	14
(c) Inherited	...	...	...	—	—	—	—	—	3	30	6	33	—
Tetanus	...	...	...	—	—	—	—	—	—	12	10	12	—
Tuberculosis	...	...	...	—	1	—	1	—	21	269	56	290	38
Whooping Cough	...	...	...	—	—	—	—	—	—	1	—	1	—
Yaws	...	...	...	—	1	—	1	—	127	1,340	9	1,467	68
Yellow Fever	...	...	...	—	—	—	—	—	—	—	—	—	—
Mumps	...	...	...	—	3	—	3	—	5	25	—	30	3
Anthrax	...	...	...	—	—	—	—	—	—	44	6	44	3
Typhus	...	...	...	—	—	—	—	—	—	—	—	—	—
Other Infectious Diseases	...	...	...	—	1	—	1	—	—	240	3	240	2
INTOXICATIONS.													
Alcoholism	...	...	...	—	—	—	—	—	—	1	—	1	—
Morphinism	...	...	...	—	—	—	—	—	—	—	—	—	—
Others	...	...	...	—	—	—	—	—	—	—	—	—	—
GENERAL DISEASES.													
Anaemia	...	...	...	—	1	—	1	—	—	14	1	14	—
Anaemia-Pernicious	...	...	...	—	—	—	—	—	—	3	2	3	1
Diabetes	...	...	...	—	—	—	—	—	—	1	—	1	—
Exophthalmic Goitre	...	...	...	—	—	—	—	—	—	—	—	—	—
Gout	...	...	...	—	—	—	—	—	—	—	—	—	—
Leucocythaemia	...	...	...	—	—	—	—	—	—	2	2	2	—



TABLE VI.—Continued.

## RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926.

DISEASES.	NON-EUROPEAN OFFICIALS.					GENERAL NATIVE POPULATION.							
	Remaining in Hos- pital at end of 1925.	Yearly Total.	Total cases treated.	Remaining in Hos- pital at end of 1926.	Remaining in Hos- pital at end of 1925.	Yearly Total.	Total cases treated.	Remaining in Hos- pital at end of 1926.					
	Admissions.	Deaths.			Admissions.	Deaths.							
GENERAL DISEASES.—(Contd.)													
Hodgkin's Disease	...	...	—	—	—	—	3	—	3	—			
Myxoedema	...	...	—	—	—	—	—	—	—	—			
Purpura	...	...	—	—	—	—	—	—	—	—			
Rickets	...	...	—	—	—	—	—	—	—	—			
Scurvy	...	...	—	—	—	—	6	—	6	1			
Other General Diseases	...	...	—	17	—	17	—	3	170	13	173	2	
LOCAL DISEASES.													
Diseases of the Nervous System.													
Sub-Section 1.													
Neuritis	...	...	...	—	2	—	2	—	1	8	—	9	—
Meningitis	...	...	...	—	—	—	—	—	—	17	8	17	—
Myelitis	...	...	...	—	—	—	—	—	2	2	—	4	1
Hydrocephalus	...	...	...	—	—	—	—	—	—	—	—	—	—
Encephalitis	...	...	...	—	—	—	—	—	1	1	—	2	—
Abscess of Brain	...	...	...	—	—	—	—	—	—	3	3	3	—
Congestion of Brain	...	...	...	—	—	—	—	—	—	—	—	—	—
Other Diseases	...	...	...	—	6	—	6	—	—	18	1	18	1
Sub-Section 2.													
Apoplexy.	...	...	...	—	—	—	—	—	—	1	1	1	—
Paralysis	...	...	...	—	1	—	1	—	1	29	2	30	2
Chorea	...	...	...	—	—	—	—	—	—	—	—	—	—
Epilepsy	...	...	...	—	1	—	1	—	2	29	2	31	1
Neuralgia	...	...	...	1	41	—	42	—	3	51	—	54	3
Hysteria	...	...	...	—	—	—	—	—	—	4	—	4	—
Other Nervous Diseases	...	...	...	—	3	—	3	—	5	47	2	52	4
Mental Diseases.													
Sub-Section 3.													
Idiocy	...	...	...	—	—	—	—	—	—	—	—	—	—
Mania	...	...	...	—	—	—	—	—	37	48	17	85	35
Melancholia	...	...	...	—	—	—	—	—	2	1	1	3	—
Dementia	...	...	...	—	—	—	—	—	27	16	11	43	19
Delusional Insanity	...	...	...	—	—	—	—	—	8	6	2	14	4
Other Mental Diseases	...	...	...	—	13	—	13	—	31	47	6	78	37
Diseases of the Eye.													
Conjunctivitis	...	...	...	—	28	—	28	—	7	278	—	285	6
Keratitis	...	...	...	—	6	—	6	—	1	10	—	11	—
Ulceration of Cornea	...	...	...	—	5	—	5	—	2	40	—	42	2
Iritis	...	...	...	—	1	—	1	—	3	17	—	20	—
Optic Neuritis	...	...	...	—	—	—	—	—	—	—	—	—	—
Cataract	...	...	...	—	—	—	—	—	2	10	—	12	2
Other Eye Diseases	...	...	...	1	24	—	25	1	5	70	—	75	—
Diseases of Ear.													
Inflammation	...	...	...	—	3	—	3	—	—	32	—	32	—
Other Diseases	...	...	...	—	7	—	7	—	—	23	—	23	—
Diseases of Nose.													
Diseases of the Circulatory System.													
Pericarditis	...	...	...	—	—	—	—	—	—	—	—	—	—
Endocarditis	...	...	...	—	—	—	—	—	—	1	—	1	1
Valvular Mitral	...	...	...	—	—	—	—	—	4	11	6	15	—
Valvular Aortic	...	...	...	—	—	—	—	—	—	3	1	3	—
Valvular Tricuspid	...	...	...	—	—	—	—	—	—	—	—	—	—
Valvular Pulmonary	...	...	...	—	—	—	—	—	—	—	—	—	—
Arterial Sclerosis	...	...	...	—	—	—	—	—	—	—	—	—	—
Aneurism	...	...	...	—	—	—	—	—	—	4	3	4	—
Other Diseases	...	...	...	1	7	1	8	—	3	49	18	52	2
Diseases of the Respiratory System.													
Laryngitis	...	...	...	—	—	—	—	—	2	39	1	41	—



TABLE VI.—Continued.

## RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926.

DISEASES.	NON-EUROPEAN OFFICIALS.				GENERAL NATIVE POPULATION.					
	Remaining in Hos- pital at end of 1925.	Yearly Total.  Admissions.	Deaths.	Total cases treated.	Remaining in Hos- pital at end of 1926.	Remaining in Hos- pital at end of 1925.	Yearly Total.  Admissions.	Deaths.	Total cases treated.	Remaining in Hos- pital at end of 1926.
LOCAL DISEASES.—(Contd.)										
Bronchitis ... ..	1	164	—	165	1	19	395	—	414	9
Broncho-Pneumonia ... ..	1	15	2	16	—	2	106	36	108	3
Abscess of Lung ... ..	—	—	—	—	—	—	1	1	1	—
Gangrene of Lung ... ..	—	—	—	—	—	—	1	—	1	—
Emphysema ... ..	—	—	—	—	—	—	3	2	3	—
Pleurisy ... ..	—	3	—	3	—	—	25	1	25	1
Empyema ... ..	—	—	—	—	—	2	2	1	4	—
Other Diseases ... ..	1	37	—	38	—	2	228	8	230	3
Diseases of the Digestive System.										
Stomatitis ... ..	—	1	—	1	—	—	23	—	23	1
Caries of Teeth ... ..	—	30	—	30	—	—	16	—	16	—
Glossitis ... ..	—	—	—	—	—	—	—	—	—	—
Sore Throat ... ..	—	8	—	8	2	1	27	—	28	—
Inflammation of Tonsils ... ..	1	21	—	22	—	—	55	—	55	—
Gastritis ... ..	—	38	—	38	—	2	11	1	13	—
Ulceration of Stomach ... ..	—	—	—	—	—	—	—	—	—	—
Haematemesis ... ..	—	—	—	—	—	—	1	—	1	—
Dilatation of Stomach ... ..	—	—	—	—	—	—	—	—	—	—
Stricture of Stomach ... ..	—	—	—	—	—	—	—	—	—	—
Dyspepsia ... ..	—	4	—	4	—	2	59	—	61	1
Enteritis ... ..	—	—	—	—	—	—	60	12	60	2
Appendicitis ... ..	—	4	—	4	—	1	9	2	10	1
Colitis ... ..	—	17	—	17	—	1	21	—	22	1
Ulceration of Intestines ... ..	—	—	—	—	—	—	2	—	2	—
Sprue ... ..	—	—	—	—	—	—	—	—	—	—
Hernia ... ..	—	1	—	1	—	4	72	4	76	1
Diarrhoea ... ..	1	73	—	74	3	8	354	4	362	4
Constipation ... ..	—	16	—	16	—	1	51	—	52	—
Colic ... ..	—	82	—	82	4	1	83	—	84	1
Haemorrhoids ... ..	—	19	—	19	—	—	12	—	12	—
Pancreatitis ... ..	—	—	—	—	—	—	—	—	—	—
Hepatitis (Acute) ... ..	—	6	—	6	—	2	20	3	22	—
Abscess ... ..	—	—	—	—	—	1	4	3	5	—
Cirrhosis ... ..	—	—	—	—	—	1	14	5	15	1
Jaundice ... ..	—	3	—	3	—	—	8	—	8	—
Peritonitis ... ..	—	—	—	—	—	1	19	12	20	2
Ascites ... ..	—	—	—	—	—	2	16	3	18	2
Other Diseases ... ..	—	21	1	21	—	1	70	11	71	4
Diseases of the Lymphatic System.										
Splenitis ... ..	—	7	—	7	—	5	47	1	52	2
Inflammation of Lymphatic Gland.	—	7	—	7	—	—	—	—	—	—
Suppuration of Lymphatic Gland.	—	1	—	1	—	2	43	—	45	1
Lymphangitis ... ..	—	—	—	—	—	—	—	—	—	—
Elephantiasis ... ..	—	—	—	—	—	—	9	—	9	1
Other Diseases ... ..	—	1	—	1	—	—	5	2	5	—
Diseases of the Urinary System.										
Acute Nephritis ... ..	—	2	1	2	—	2	27	11	29	3
Bright's Disease ... ..	—	2	—	2	—	2	7	5	9	—
Pyelitis ... ..	—	—	—	—	—	—	1	—	1	—
Calculus ... ..	—	—	—	—	—	—	—	—	—	—
Renal Colic ... ..	—	1	—	1	—	—	1	—	1	—
Cystitis ... ..	—	5	—	5	—	—	10	2	10	—
Vesical Calculus ... ..	—	—	—	—	—	—	—	—	—	—
Suppression ... ..	—	—	—	—	—	—	—	—	—	—
Haematuria ... ..	—	1	—	1	—	—	14	—	14	—
Chyluria ... ..	—	—	—	—	—	—	—	—	—	—
Other Diseases ... ..	—	1	—	1	—	—	15	1	15	1



TABLE VI.—Continued.

## RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926.

DISEASES.	NON-EUROPEAN OFFICIALS.				GENERAL NATIVE POPULATION.			
	Remaining in Hos- pital at end of 1925.	Yearly Total.		Remaining in Hos- pital at end of 1926.	Remaining in Hos- pital at end of 1925.	Yearly Total.		Remaining in Hos- pital at end of 1926.
		Admissions.	Deaths.	Total cases treated.		Admissions.	Deaths.	Total cases treated.
LOCAL DISEASES.—(Contd.)								
Diseases of the Generative System.								
Male Organs.								
Urethritis ... ..	—	—	—	—	—	1	—	1
Gleet ... ..	—	—	—	—	—	—	—	—
Stricture ... ..	—	—	—	—	—	7	1	7
Prostatitis ... ..	—	—	—	—	—	4	—	4
Soft Chancre ... ..	—	—	—	—	—	18	—	18
Condyloma ... ..	—	—	—	—	—	6	—	6
Inflammation of Scrotum ... ..	—	—	—	—	—	3	—	3
Hydrocele ... ..	—	—	—	—	9	95	—	104
Orchitis ... ..	—	4	—	4	4	47	—	51
Epididymitis ... ..	—	—	—	—	1	9	—	10
Abscess of Testicle ... ..	—	—	—	—	—	—	—	—
Other Diseases ... ..	—	—	—	—	5	68	2	73
Female Organs.								
Ovaritis ... ..	—	—	—	—	—	—	—	—
Ovarian Cyst ... ..	—	—	—	—	—	8	1	8
Displacement of Uterus ... ..	—	—	—	—	—	2	—	2
Vaginitis ... ..	—	—	—	—	—	1	—	1
Amenorrhoea ... ..	—	—	—	—	—	—	—	—
Dysmenorrhoea ... ..	—	—	—	—	—	3	—	3
Menorrhagia ... ..	—	—	—	—	—	—	—	—
Leucorrhoea ... ..	—	—	—	—	—	—	—	—
Abortion ... ..	—	—	—	—	—	17	—	17
Delayed Labour ... ..	—	—	—	—	—	27	4	27
Post-partum Haemorrhage ... ..	—	—	—	—	—	—	—	—
Retained Placenta ... ..	—	—	—	—	—	16	2	16
Premature Birth ... ..	—	—	—	—	—	3	1	3
Puerperal Septicaemia ... ..	—	—	—	—	—	5	1	5
Mastitis ... ..	—	—	—	—	—	—	—	—
Abscess of Breast ... ..	—	—	—	—	—	6	—	6
Other Diseases ... ..	—	2	—	2	—	41	3	41
Diseases of the Organs of Locomotion.								
Osteitis ... ..	—	1	—	1	5	21	2	26
Arthritis ... ..	—	2	—	2	8	71	1	79
Spondylitis ... ..	—	—	—	—	—	36	—	36
Bursitis ... ..	—	—	—	—	—	1	—	1
Other Diseases ... ..	3	135	—	138	1	30	368	4
Diseases of the Connective Tissue.								
Cellulitis ... ..	—	2	—	2	10	189	—	199
Abscess ... ..	—	14	—	14	17	328	4	345
Elephantiasis ... ..	—	—	—	—	—	22	—	22
Other Diseases ... ..	—	13	—	13	1	44	666	2
Diseases of the Skin.								
Urticaria ... ..	—	8	—	8	—	12	—	12
Eczema ... ..	—	11	—	11	—	23	—	23
Boil ... ..	1	46	—	47	1	28	—	29
Carbuncle ... ..	—	3	—	3	—	1	—	1
Herpes ... ..	—	—	—	—	—	4	—	4
Psoriasis ... ..	—	1	—	1	—	6	—	6
Oriental Sore ... ..	—	—	—	—	—	17	—	17
Tinea ... ..	—	—	—	—	—	3	—	3
Scabies ... ..	—	15	—	15	8	196	1	204
Acne ... ..	—	—	—	—	—	2	—	2
Prickly Heat ... ..	—	—	—	—	—	15	—	15
Other Diseases ... ..	—	20	—	20	100	968	2	1,068



TABLE VI.—Continued.

## RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1926.

DISEASES.	NON-EUROPEAN OFFICIALS.				GENERAL NATIVE POPULATION.					
	Remaining in Hos- pital at end of 1925.	Yearly Total.  Admissions.	Deaths.	Total cases treated.	Remaining in Hos- pital at end of 1925.	Yearly Total.  Admissions.	Deaths.	Total cases treated.	Remaining in Hos- pital at end of 1926.	
LOCAL DISEASES.—(Contd.).										
Injuries—General.	—	3	—	3	—	2	25	7	27	—
Local ... ..	4	200	1	204	2	192	2,943	55	3,135	248
*Surgical Operations ... ..	—	(9)	—	—	—	(1,365)	—	—	—	—
Tumours ... ..	—	1	—	1	—	7	141	12	148	9
Malformations ... ..	—	—	—	—	—	—	3	—	3	1
Poisons ... ..	—	—	—	—	—	—	56	2	56	1
Parasites—Animal ... ..	—	—	—	—	—	—	—	—	—	—
Protozoa ... ..	—	—	—	—	—	—	—	—	—	—
Trematoda (Flukes) ... ..	—	—	—	—	—	1	28	1	29	2
Cestoda—										
Taenia Solium ... ..	—	—	—	—	—	—	157	—	157	2
Taenia Saginata ... ..	—	—	—	—	—	3	32	1	35	—
Nematoda—										
Ascaris ... ..	—	—	—	—	—	3	129	—	132	3
Tricocephalus Dispar ... ..	—	—	—	—	—	—	—	—	—	—
Trichina ... ..	—	—	—	—	—	—	—	—	—	—
Dracunculus ... ..	—	—	—	—	—	—	12	—	12	—
Filariasis ... ..	—	—	—	—	—	—	—	—	—	—
Strongylus ... ..	—	—	—	—	—	—	—	—	—	—
Ankylostomiasis ... ..	—	3	—	3	—	5	134	16	139	5
Oxyuris ... ..	—	—	—	—	—	—	5	—	5	—
Insecta—										
Myiasis ... ..	—	—	—	—	—	—	—	—	—	—
Other Diseases ... ..	—	—	—	—	—	8	24	—	32	2
TOTAL. ...	57	4,772	7	4,829	41	1,366	22,856	1,064	24,222	1,338

\*Recorded under respective diseases.



TABLE VII.

RETURN OF DISEASES (OUT PATIENTS) FOR THE YEAR 1925.

Diseases.	EUROPEAN OFFICIALS.		EUROPEAN GENERAL POPULATION.		NON-EUROPEAN OFFICIALS.		NATIVE GENERAL POPULATION.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
INFECTIVE DISEASES:								
Beri-Beri ...	—	—	—	—	—	—	—	—
Cerebro-spinal fever ...	—	—	—	—	—	—	1	—
Chicken-pox ...	—	—	—	—	—	—	94	2
Cholera ...	—	—	—	—	—	—	—	—
Dengue ...	—	—	—	1	—	—	2	—
Diphtheria ...	—	—	—	—	—	—	—	—
Dysentery ...	—	—	2	2	4	—	358	163
Endocarditis-Infective ...	—	—	—	—	—	—	—	—
Enteric fever ...	—	—	—	—	—	—	—	—
Erysipelas ...	—	—	—	—	—	—	—	—
Gonorrhoea ...	—	—	2	—	1	—	842	14
Influenza ...	26	2	12	9	50	—	3,331	656
Kala Azar ...	—	—	—	—	—	—	—	—
Leprosy—								
(a) Nodular ...	—	—	—	—	—	—	34	6
(b) Anaesthetic ...	—	—	—	—	—	—	56	19
Malaria—								
(a) Sub-Tertian ...	18	1	26	3	28	—	1,063	657
(b) Benign-Tertian ...	2	—	2	—	2	—	2,231	20
(c) Quartan ...	—	—	—	—	—	—	5	—
(d) Undifferentiated ...	45	—	23	30	205	—	24,454	4,035
(e) Black-water ...	2	—	1	—	—	—	2	1
Measles ...	—	—	—	2	—	—	59	1
Malta Fever ...	—	—	—	—	—	—	—	—
Plague ...	—	—	—	—	—	—	4	2
Pneumonia ...	—	—	1	—	—	—	154	33
Rabies ...	—	—	—	—	—	—	—	—
Relapsing Fever ...	—	—	—	—	—	—	4	3
Rheumatic Fever ...	—	—	—	—	—	—	3	1
Septicaemia ...	—	—	—	—	—	—	—	3
Trypanosomiasis (Sleeping Sickness)	—	—	—	—	—	—	—	—
Small-pox ...	—	—	—	—	—	—	1	—
Syphilis—								
(a) Primary ...	—	—	2	—	—	—	1,039	560
(b) Secondary ...	—	—	—	—	1	—	2,010	1,327
(c) Inherited ...	—	—	—	—	—	—	476	541
Tetanus ...	—	—	—	—	—	—	6	1
Tuberculosis ...	1	—	—	—	—	—	120	57
Whooping Cough ...	—	—	—	—	—	—	13	8
Yaws ...	—	—	—	—	—	—	11,490	8,066
Yellow Fever ...	—	—	—	—	—	—	—	—
Mumps ...	—	—	—	—	—	—	—	4
Anthrax ...	—	—	—	—	—	—	22	—
Typhus ...	—	—	—	—	—	—	—	—
Other Infective Diseases ...	5	—	4	1	—	—	77	13
INTOXICATIONS:								
Alcoholism ...	—	—	1	—	—	—	—	—
Morphinism ...	—	—	—	—	—	—	—	—
Others ...	—	—	—	—	—	—	—	1
GENERAL DISEASES:								
Anaemia ...	1	1	1	1	2	—	144	39
Anaemia-Pernicious ...	—	—	—	—	—	—	—	—
Diabetes ...	—	—	—	—	—	—	5	—
Exophthalmic Goitre ...	—	—	—	—	—	—	—	—
Gout ...	—	—	—	—	—	—	—	—
Leucocythaemia ...	—	—	—	—	—	—	—	—



TABLE VII.—Continued.

## RETURN OF DISEASES (OUT PATIENTS) FOR THE YEAR 1925.

Diseases.	EUROPEAN OFFICIALS.		EUROPEAN GENERAL POPULATION.		NON-EUROPEAN OFFICIALS.		NATIVE GENERAL POPULATION.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
GENERAL DISEASES.—Continued.								
Hodgkin's Disease ... ..	—	—	—	—	—	—	—	—
Myxoedema ... ..	—	—	—	—	—	—	—	—
Purpura ... ..	—	—	—	—	—	—	—	—
Rickets ... ..	—	—	—	—	—	—	—	1
Scurvy ... ..	—	—	—	—	—	—	8	4
Other General Diseases ... ..	13	5	22	8	7	—	522	69
LOCAL DISEASES:								
Diseases of the Nervous System ...	14	1	19	8	45	—	2,370	379
Mental Diseases ... ..	—	—	1	1	—	—	23	8
Diseases of the Eye ... ..	4	—	8	2	22	—	4,555	2,224
„ Ear ... ..	11	—	15	8	10	—	1,816	472
„ Nose ... ..	7	—	1	4	23	—	397	81
„ Circulatory System. ...	3	—	1	—	—	—	58	15
„ Respiratory System. ...	30	2	21	17	123	—	17,290	2,930
„ Digestive System. ...	94	7	91	37	156	—	18,683	4,295
„ Lymphatic System. ...	—	—	3	2	1	—	959	182
„ Urinary System. ...	—	—	5	1	1	—	80	14
„ Generative System. ...	1	1	20	11	3	—	376	535
„ Organs of Locomotion ...	10	1	6	4	29	—	6,708	2,066
„ Connective Tissue. ...	23	—	43	13	11	—	4,588	1,101
„ Skin ... ..	25	—	69	15	41	—	13,604	2,213
Injuries—								
General ... ..	—	—	—	—	—	—	286	368
Local ... ..	62	—	43	8	66	—	21,442	3,409
*Surgical Operations ... ..	—	—	—	—	—	—	—	—
Tumours ... ..	1	—	1	—	—	—	27	5
Malformations ... ..	—	—	—	—	—	—	2	2
Poisons ... ..	—	—	—	—	—	—	46	4
Parasites-Animal ... ..	—	—	7	4	1	—	4,201	1,585
TOTAL ... ..	408	21	456	192	932	—	146,271	38,195



TABLE VIII.

EUROPEANS.

RETURN OF INFECTIVE DISEASES AT THE VARIOUS HOSPITALS AND DISPENSARIES IN THE COLONY & PROTECTORATE OF KENYA DURING THE YEAR 1926.

DISEASES.	Eldoret.	Fort-Hall.	Kakamega.	Mandera.	Kitui.	Kisumu.	Lamu.	Lodwar.	Machakos.	Malindi.	Mombasa.	Meru.	Nairobi.	Nakuru.	Nandi.	Nyeri.	Voi.	TOTAL.
Cerebro-spinal Fever.	(Cases.																	
	Deaths.																	
Chicken-pox	(Cases.																	3
	Deaths.																	3
Dengue.	(Cases.				1					2								1
	Deaths.				1													1
Diphtheria.	(Cases.																	
	Deaths.								3					1				50
Dysentery.	(Cases.	2				1	1				20	1		1			2	1
	Deaths.				1						1							8
Enteric Fever.	(Cases.				1						1							
	Deaths.																	
Influenza.	(Cases.	6	1	1		21		1	10	1	65		137	5	1	17	11	287
	Deaths.					115	4		18	2	105	5	419	21		6	25	838
Malaria.	(Cases.	42	4	2	19						1		10					1
	Deaths.				1	3					1		2					18
Blackwater Fever.	(Cases.	1									1		9					6
	Deaths.					2						1	1					13
Pneumonia.	(Cases.					1												2
	Deaths.																	
Relapsing Fever.	(Cases.																	
	Deaths.																	
Typhus.	(Cases.																	
	Deaths.																	
Septicaemia.	(Cases.																	
	Deaths.																	
Small-pox.	(Cases.																	
	Deaths.										2		2					4
Mumps.	(Cases.																	
	Deaths.												3		1			6
Tuberculosis	(Cases.					2												
	Deaths.					2					3		2					8
Measles.	(Cases.	1																
	Deaths.																	3
Syphilis.	(Cases.										2							
	Deaths.												1					1
Anthrax.	(Cases.								1									
	Deaths.																	



TABLE VIII.

RETURN OF INFECTIVE DISEASES TREATED AT THE VARIOUS HOSPITALS IN THE COLONY AND PROTECTORATE OF KENYA DURING THE YEAR 1926.  
NATIVES (INCLUDING ASIATICS).

DISEASES.			Eldoret.	Fort-Hall.	Kakamega.	Kilindini.	Kitui.	Kisii.	Kisumu.	Kericho.	Lamu.	Lodwar.	Machakos.	Malindi.	Mandera.	Mombasa.	Moyale.	Meru.	Nairobi.	Nakuru.	Nandi.	Nyeri.	Railway Const.	Voi.	Kacheliba.	TOTAL.
Beri-beri.	...	(Cases. ... (Deaths. ...	5 2	— —	— —	— —	— —	— —	— —	— —	— —	1 —	— —	1 —	3 —	— —	— —	— —	— —	1 —	1 —	— —	— —	2 1	— —	13 3
Cerebro-spinal Fever.	...	(Cases. ... (Deaths. ...	— —	3 2	3 3	— —	— —	— —	8 4	— —	— —	— —	2 2	— —	— —	3 1	— —	— —	8 6	5 4	— —	— —	— —	5 —	— —	37 22
Chicken-pox.	...	(Cases. ... (Deaths. ...	18 —	19 —	3 —	1 —	— —	9 —	27 —	2 —	— —	— —	1 —	— —	1 —	28 —	— —	29 —	45 —	93 —	— —	45 —	4 —	35 —	— —	360 —
Dengue.	...	(Cases. ... (Deaths. ...	— —	— —	— —	— —	5 —	— —	— —	— —	— —	— —	— —	1 —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	6 —
Dysentery.	...	(Cases. ... (Deaths. ...	34 4	23 3	3 —	47 —	106 —	143 3	26 3	6 —	80 —	2 —	17 1	4 —	10 1	45 1	89 2	9 2	198 22	18 11	3 1	35 3	36 5	11 2	— —	945 64
Enteric Fever.	...	(Cases. ... (Deaths. ...	— —	— —	— —	— —	— —	— —	7 —	— —	— —	— —	1 —	— —	1 1	5 —	— —	— —	32 5	— —	— —	— —	— —	2 —	— —	48 6
Influenza.	...	(Cases. ... (Deaths. ...	374 2	65 —	308 —	191 —	7 —	162 —	419 —	76 —	— —	23 —	93 —	74 —	16 —	194 —	— —	69 —	1,636 —	105 —	496 —	383 2	87 —	325 2	— —	5,103 6
Leprosy.	...	(Cases. ... (Deaths. ...	— —	— —	47 —	— —	9 —	41 1	74 —	— —	— —	— —	3 —	1 —	— —	2 —	18 —	2 —	35 3	3 —	— —	8 —	— —	— —	— —	243 4
Malaria.	...	(Cases. ... (Deaths. ...	716 4	2,816 24	106 —	2,199 —	265 —	822 1	4690 6	25 —	1,516 —	329 1	661 1	1,086 —	250 —	5,850 11	3,936 —	1,708 1	11,068 92	930 9	705 —	729 3	263 1	1,407 2	102 —	42,134 156
Blackwater Fever.	...	(Cases. ... (Deaths. ...	— —	7 4	— —	— —	1 —	— —	3 —	— —	— —	2 —	— —	— —	— —	10 3	— —	— —	6 2	1 1	— —	— —	— —	4 —	— —	34 10
Measles.	...	(Cases. ... (Deaths. ...	10 —	6 —	4 —	36 —	— —	1 —	10 —	— —	— —	2 —	2 —	1 —	— —	40 —	— —	3 —	104 —	— —	— —	— —	— —	1 1	— —	220 1
Malta-Fever.	...	(Cases. ... (Deaths. ...	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	2 —	— —	— —	— —	— —	1 —	— —	3 —
Plague.	...	(Cases. ... (Deaths. ...	— —	— —	9 4	— —	— —	9 4	12 6	— —	— —	— —	— —	— —	— —	— —	— —	— —	41 22	8 5	— —	2 1	3 2	— —	— —	84 44
Pneumonia.	...	(Cases. ... (Deaths. ...	56 10	69 16	16 4	2 —	17 3	80 4	162 17	2 —	4 —	3 1	23 3	— —	3 1	113 32	7 1	22 4	449 112	74 26	25 1	3 —	74 9	47 8	— 1	1,251 253
Relapsing Fever.	...	(Cases. ... (Deaths. ...	4 —	81 2	2 —	— —	— —	34 —	19 2	— —	— —	— —	— —	— —	— —	3 —	— —	8 —	35 2	— —	1 —	— —	1 —	— —	— —	188 6
Septicaemia.	...	(Cases. ... (Deaths. ...	— —	— —	— —	— —	— —	— —	3 3	— —	3 1	— —	— —	— —	— —	7 7	— —	— —	8 6	— —	— —	— —	1 1	— —	— —	22 18
Trypanosomiasis.	...	(Cases. ... (Deaths. ...	— —	— —	— —	— —	— —	25 1	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	2 —	— —	— —	— —	— —	— —	— —	27 1
Small-pox.	...	(Cases. ... (Deaths. ...	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	1 —	— —	— —	— —	— —	— —	— —	— —	— —	— —	1 —
Syphilis.	...	(Cases. ... (Deaths. ...	210 1	32 —	77 —	6 —	13 —	1,097 —	1,963 3	9 —	9 —	32 —	12 —	15 —	13 —	135 —	2,067 —	16 —	276 10	500 3	218 —	19 —	13 —	53 1	— —	6,785 18
Tetanus.	...	(Cases. ... (Deaths. ...	— —	2 1	— —	— —	— —	— —	1 1	1 1	— —	— —	— —	2 1	— —	6 3	— —	— —	6 3	— —	1 —	— —	— —	— —	— —	19 10
Tuberculosis.	...	(Cases. ... (Deaths. ...	6 1	87 19	9 1	2 —	4 —	75 1	22 3	3 —	10 2	1 —	10 3	16 —	4 —	53 2	42 —	8 1	49 14	20 4	— —	11 2	— —	13 3	2 —	447 56
Yaws.	...	(Cases. ... (Deaths. ...	8 —	147 —	611 4	2 —	1,066 1	2,816 —	1,936 —	4 —	487 —	— —	118 1	1,517 —	1 —	6,718 —	— —	1,826 —	151 2	48 —	103 —	2,326 1	5 —	1,013 —	— —	20,897 9
Mumps.	...	(Cases. ... (Deaths. ...	1 —	15 —	— —	3 —	— —	1 —	1 —	— —	— —	— —	— —	— —	— —	11 —	— —	3 —	11 —	— —	— —	7 —	1 —	— —	— —	54 —
Anthrax.	...	(Cases. ... (Deaths. ...	1 —	8 —	— —	— —	— —	— —	1 —	— —	— —	— —	— —	— —	— —	— —	— —	3 1	22 1	9 4	— —	— —	— —	— —	— —	44 6

N.B.—The figures in respect to Yaws and Syphilis are exclusive of the number treated by Medical Officers at out-dispensaries.







TABLE IX.

STATISTICS REGARDING ENTERIC FEVER AMONG EUROPEAN RESIDENTS IN THE COLONY & PROTECTORATE OF KENYA DURING 1926.

TOTAL NUMBER ADMITTED ON ACCOUNT OF ENTERIC.				NUMBER OF CASES WHO DIED.				Total number inoculated against enteric fever during the year.	
Officials.		Non-Officials.		Officials.		Non-Officials.		Officials.	Non-Officials.
Cases.	Deaths.	Cases.	Deaths.	Officials.	Non-Officials.	Officials.	Non-Officials.	Officials.	Non-Officials.
3	—	5	—	—	—	—	—	—	—
The occurrence of the cases was as follows:—									
Nairobi	...	...	...	5	—	—	—	—	—
Kitui	...	...	...	—	—	—	—	—	—
Eldoret	...	...	...	—	—	—	—	—	—
Mombasa	...	...	...	—	—	—	—	—	—
			8						



## APPENDIX "A."

ANNUAL REPORT OF THE PROCEEDINGS OF THE BOARD OF  
HEALTH FOR THE YEAR 1926.

---

The Public Health (Building) Ordinance (No. 10 of 1913).

## (1) The membership of the Board consisted of :—

The Hon. the Director of Medical and Sanitary Services (President).

The Hon. the Director of Public Works.

The Hon. the Commissioner of Lands.

The Hon. the Director of Land Survey.

A. C. Tannahill, Esq.

The Deputy Director of Sanitary Service.

## (2) Summary of work done :—

(a) Meetings held during the year	...	...	...	...	...	4
(b) Applications for sub-divisions outstanding from previous year.						2
(c) Applications for sub-divisions submitted during the year	...					10
(d) Applications for sub-divisions approved during the year	...					7
(e) Applications for sub-divisions rejected during the year	...					2
(f) Applications for sub-divisions referred back for modifications.						1
(g) Applications for sub-divisions re-submitted	...	...	...			—
(h) Applications for sub-divisions outstanding at end of year	...					2

The applications submitted during the year were with two exceptions concerned only with the sub-division of plots of from three to five acres in extent into smaller plots of approximately one acre each in extent; these applications were with one exception approved subject only to minor modifications being made more particularly in the matter of the truncation of corners.

One application for permission to divide an area of land into eleven plots of from one-half to three quarters of an acre in extent, immediately adjoining the Nairobi Municipal boundary, was disapproved on the grounds that no provision had been made in respect of sanitary services.

Of the two applications which were submitted in respect of larger areas one was for the lay-out of business plots in the neighbourhood of Gilgil Railway Station. This application was approved and a recommendation forwarded to Government to the effect that the area should be declared to be a township in order that adequate control might be exercised over building operations. The other application for sub-division of a larger area had reference to a proposal to sub-divide an area in the neighbourhood of Elburgon Railway Station into large plots for a posho mill and for purposes of general trading. This application was also approved.

C. J. WILSON,  
President.

## APPENDIX "B."

ANNUAL REPORT OF THE PROCEEDINGS OF THE CENTRAL BOARD  
OF HEALTH FOR THE YEAR 1925.

---

(The Public Health Ordinance No. 38 of 1921).

**1. Members of the Board, Resignations, New Appointments.**

## (a) The Membership of the Board consisted of :—

The Hon. the Director of Medical and Sanitary Services, J. L. Gilks, Esq., M.R.C.S. (Eng.), L.R.C.P. (Lond.), F.R.C.S. (Edin.), Chairman.

The Deputy Director of Sanitary Service, A. R. Paterson, Esq., M.B., Ch.B. (Glas.), D.P.H. (Camb.), D.T.M. & H., (Camb.)



G. V. W. Anderson, Esq., M.B., B.S., (Lond.), F.R.C.S. (Eng.)

W. H. Kauntze, Esq., M.B.E., B.A., M.D., M.B., B.S. (Lond.),  
D.H.T. (Vict.)

G. V. Maxwell, Esq., M.L.C.

H. L. Sikes, Esq., M.L.C., B.A., B.E., M.Inst.C.E., F.G.S,

A. J. Jex-Blake, Esq., M.A., M.D. (Oxon.), F.R.C.P., (Lond.)

T. A. Wood, Esq., M.L.C., C.M.G., M.B.E.

C. R. Davidson, Esq., A.M.I.C.E.

The Deputy Director of Sanitary Service acted as Secretary throughout the year.

(b) The Director of Medical and Sanitary Services was absent on leave during the latter half of the year and the position of Chairman was filled by the Ag. Director of Medical and Sanitary Services, Dr. C. J. Wilson.

(c) Mr. J. A. Watson, W.S., resigned his membership of the Board during the year and Mr. C. R. Davidson was appointed to fill the vacancy which resulted.

(d) Lt.-Col. Watkins proceeded on leave during the year and Mr. Maxwell was appointed a member of the Board.

## **2. Meetings of the Board.**

Five meetings of the Board were held during the year.

## **3. Regulations submitted to the Board for Confirmation.**

No regulations were submitted to the Board during the year by local authorities.

## **4. Resolutions adopted by the Board during the year.**

### **(a) CONSTITUTION OF THE BOARD.**

The Board adopted a resolution to the effect that with a view to bringing the Board into closer touch with Government the constitution of the Board should be so altered that the Colonial Secretary should become Chairman of the Board and the Director of Medical and Sanitary Services Secretary to the Board.

This Resolution was remitted by Government to the Local Government Commission for consideration.

### **(b) PREVENTION OF MALARIA.**

The following important resolution was adopted by the Board:—

“ That this Board desires to invite the attention of Government to the serious menace to the Public Health which is occasioned by the existence of undrained borrow pits both in townships and in the neighbourhood of roads and railways throughout the country . . . . .

The Board cannot but view with concern the possibility of any increase of the incidence of Malaria in the Colony and is of opinion that it is a matter of grave importance that every practicable step should be taken not only to prevent the creation of new mosquito breeding places in townships and in the country but also to secure the elimination of as many as possible of those breeding places which are already in existence. The Board respectfully submits that in order to prevent the creation of new mosquito breeding places it should be a matter of Government policy that where funds are provided by Government for the construction of roads or railways arrangements should in all cases be made to ensure as far as possible that all borrow pits dug in connection with the construction or maintenance thereof should either be filled in or adequately drained that where construction or maintenance is put out to contract it should be a condition of any such contract that all pits dug should be so filled in or drained.

The Board is also of opinion that it is of the greatest importance that some provision should be made in the Colonial Estimates for the forthcoming year towards the filling in of the many borrow pits in the neighbourhood of Nairobi and for the execution of such other anti-malarial works in or in the neighbourhood of Nairobi as it may be the responsibility of Government to carry out . . . . . ”.



## (c) TOWNPLANNING.

The Board adopted a resolution to the effect that suitable reservations should be made for hospitals in all townplanning schemes and that before any final selection might be made by Government the opinion of the Board should be obtained.

## (d) SITING OF HOSPITALS IN NAIROBI.

Subsequent to the adoption of the resolution referred to in the preceding paragraph the Board was invited to express an opinion with regard to a site which had been suggested as suitable for an Indian Hospital in Nairobi. The Board gave very careful consideration to the matter and advised Government that in view of the many advantages which would be gained by the concentration and development of all hospital activities and laboratory facilities in a single area and in view of the fact that the proposed site was not one which would lend itself to such concentration and development it was unable to recommend the adoption of the site which was suggested. The Board indicated to Government a site which in the opinion of the Board would be suitable for development as a hospital area and on which hospital facilities for all communities might be provided, a laboratory situated and an infectious diseases hospital and a training depot for African subordinate staff established.

## (e) PREVENTION OF PLAGUE.

The Board adopted a resolution to the effect that Government be requested to invite the Council of the Municipal Corporation of Nairobi to give further consideration to the desirability of extending the application of the Council's bye-law which in certain streets restricts construction to stone, brick or concrete, to a larger area and more particularly to that part of the town which had been or was likely to be closely developed either for business or residential purposes.

## (f) SALE OF MILK IN SEALED RECEPTACLES.

The Board considered a recommendation received from the Council of the Municipal Corporation of Nairobi to the effect that the sale of milk in sealed receptacles might be permitted from suitable premises not necessarily complying with all the requirements of a dairy as laid down in the Public Health (Milk and Dairies) Regulations.

The Board advised Government that the Regulations should be so amended as to allow of such sale from premises suitable for the purpose.

## (g) CONTROL OF SPITTING.

The Board gave consideration to this matter and advised Government that in its opinion it was desirable that a rule or regulation should be introduced whereby the control of spitting by natives might be effected in at least public places such as Railway Stations, Public Buildings and Footpaths.

**5. Matters discussed by the Board during the Year.**

Among matters discussed at meetings of the Board held during the year, with regard to which no definite Resolutions were adopted, were the following :—

- (a) Human Trypanosomiasis.
- (b) Draft Drainage Regulations—Sub-committee appointed.
- (c) Appointment of a Government Town Planner.
- (d) Research Programme of the Government Medical Research Laboratory.
- (e) Medical Estimates for 1927.
- (f) Local Government.
- (g) Provision of Medical Relief in Settled Areas.

C. J. WILSON,  
Chairman.



COLONY AND PROTECTORATE OF KENYA.



ANNUAL REPORT

OF THE

MEDICAL RESEARCH LABORATORY

FOR THE YEAR 1926.

BY

W. N. KAUNTZE, M.D., D.P.H.

*Director of Laboratory.*







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# MEDICAL RESEARCH LABORATORY.

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## KENYA COLONY & PROTECTORATE.

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STAFF, 1926.

DIRECTOR OF LABORATORY.

W. H. Kauntze.

SENIOR BACTERIOLOGIST :

G. V. Allen.

ASSISTANT BACTERIOLOGISTS :

R. N. Hunter (till August 15th, 1926).

J. C. J. Callanan.

F. P. G. de Smidt.

GOVERNMENT ANALYST :

W. C. Birch (till September 9th, 1926).

CHEMICAL OFFICER :

F. C. Kelly.

MEDICAL ENTOMOLOGIST :

C. B. Symes.

LABORATORY ASSISTANTS :

F. A. Bailey.

J. A. Bell.

J. S. McDonald.

H. N. Nefdt.

R. Brunsten (Learner).

W. E. Grainger (Learner).

T. Jones (Learner).

Ramji Das.

W. Pema.

J. St. A. M. de Sousa.

Faqir Mohamed.

Elisha Nyalondo.

LIBRARIAN AND STENOGRAPHER :

Miss J. Whitworth (till November 20th).

Miss J. M. C. Millett.

CLERK AND STOREKEEPER :

M. de Souza.



**ANNUAL REPORT OF THE MEDICAL RESEARCH LABORATORY,  
KENYA COLONY AND PROTECTORATE, FOR 1926.**

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**A. ADMINISTRATIVE SECTION.**

**1. CHANGES IN STAFF.**

- Dr. Hunter, Assistant Bacteriologist, promoted Senior Sanitation Officer on 1st July, 1926, and transferred to Sanitation Division, Medical Department.
- Dr. Callanan, Medical Officer, transferred from Medical Division, Medical Department, as Assistant Bacteriologist, on 3rd May, 1925.
- Dr. de Smidt, Assistant Bacteriologist, assumed duty on 19th July, 1926.
- Dr. Kelly, Chemical Officer, assumed duty on 20th February, 1926.
- Mr. McDonald, Laboratory Assistant, transferred from Veterinary Department, and assumed duty on 8th March, 1926.
- Mr. Nefdt was appointed Laboratory Assistant on 26th July, 1926.
- Mr. Grainger was appointed Laboratory Assistant (Learner Grade) on 16th February, 1926.
- Mr. Jones was appointed Laboratory Assistant (Learner Grade) on 8th March, 1926.
- Miss Whitworth, Librarian and Stenographer, was appointed on 21st May, 1926, but resigned on 20th November, 1926.
- Miss Millett transferred from the Head Office and took over duties of Librarian and Stenographer on 15th November, 1926.
- Mr. Faqir Mohamed was appointed Laboratory Assistant on 26th February, 1926.
- Mr. de Souza was appointed Laboratory Assistant on 19th July, 1926.

**2. LEAVE.**

- Mr. Birch proceeded on leave on 17th May, 1926 and retired from Colonial Service on 2nd September, 1926.
- Mr. Bailey proceeded on leave on 31st March, 1926, and returned to the Colony on 30th September, 1926.
- Mr. McDonald proceeded on leave on 16th November, 1926.
- Miss Wishart proceeded on leave on termination of appointment on 26th June, 1926.
- Mr. Pema returned from leave on 7th June, 1926.

**3. ORGANISATION.**

No change in organisation has taken place during the year. The staff detailed in the 1926 Annual Report has not been completed as regards the Entomological Section. The two Assistant Bacteriologists were appointed but the full advantage of their posting was not obtained by the Laboratory owing to the transference of Dr. Hunter to the Sanitation Division. No applicants came forward for one of the European Laboratory Assistants, Learner Grade posts, so that only two of these positions were filled.

**4. LIBRARY.**

The card index system for the classification of subject matter for reference has been discontinued owing to lack of staff required to carry this on. Instead, the "Index Medious," the "Quarterly Cumulative Index" and the "Bulletin of Tropical Medicine" are being used for easy reference to published papers.

The books, journals and pamphlets in the Library have been re-arranged and re-catalogued, and a complete list of its contents is now available.

A catalogue of books and journals is about to be issued to all Medical Officers in the Colony.

**5. BUILDINGS.**

There is no change to record for the past year. The question of the new Laboratory building is now wrapped up in the scheme for a combined hospital for Nairobi, the policy being to site both these institutions on the same area of ground. From the point of view of clinical pathology this will be a very convenient arrangement as it will enable the staff of the Laboratory to keep in close touch with the clinical side of their investigations.



## 6. RESEARCH.

The following articles have been published during 1926 by members of the Laboratory Staff in the Journal noted:—

- W. H. Kauntze.—The Laboratory in Relation to Medical Practice in Kenya (*Kenya Medical Journal*, Vol. II., p. 509).
- T. C. Cochrane and G. V. Allen.—A rare form of *Plasmodium Vivax*, (*Kenya Medical Journal*, Vol. II., p. 344.)
- J. C. J. Callanan.—Foodstuffs of the Luo Tribe, (*Kenya Medical Journal*, Vol. III., p. 56.)
- J. C. J. Callanan.—Some observations on *Framboesia Tropica*, made in a district of Kikuyu Province, Kenya Colony, (*Kenya Medical Journal*, Vol. III., p. 62.)
- C. B. Symes.—The Mosquito Problem in Kenya (*Kenya Medical Journal*, Vol. III., p. 93.)
- F. C. Kelly.—Recent Advances in Biochemistry, (*Kenya Medical Journal*, Vol. III., p. 104.)
- J. C. J. Callanan.—*Embedomoras Intestinalis* in a Kisii Native, (*Kenya Medical Journal*, Vol. III., p. 170.)
- J. C. J. Callanan.—A Side-Light on the Production of *P. Tenue* (Stephens), (*Kenya Medical Journal*, Vol. III., p. 102.)
- F. C. Kelly.—The Purification of Water polluted by Sisal Effluent, (*Kenya Medical Journal*, Vol. III., p. 212.)
- R. Hunter.—Experiments on the use of Rat Poisons, (*Kenya Medical Journal*, Vol. III., p. 223.)
- G. V. Allen.—A Comparison of the Garrow and Dreyer Techniques in Agglutination, (*Kenya Medical Journal*, Vol. III., p. 245.)

Investigations into Trypanosomiasis, Malaria, Yaws, Plague, Intestinal Worms, and the influence of diet on disease have been initiated or continued during 1926.

## (a) TRYPANOSOMIASIS.

The work which has been carried on by the Medical Entomologist who has been investigating this disease, is detailed under the work of the Entomological Section. It has mainly consisted of the continuance of observation of the tsetse fly areas which were mapped out during 1925. From the purely Laboratory aspect a certain amount of research has been conducted by the inoculation of various animals with strains of Trypanosomes derived from Tanganyika Territory through the courtesy of Dr. Corson, Assistant Bacteriologist of that Territory, who is stationed at Musoma. In all, four strains have been received from this source, and a series of transmission experiments has been initiated and is still in progress. So far it is impossible to detail the results of these experiments, but some conclusions should be available during the coming year. An endeavour has been made by the Medical Entomologist to determine the food hosts of the tsetse fly by serological tests. Up to the present no definite conclusions have been obtained.

## (b) MALARIA.

Most of the work that has been carried on during 1926 on this subject has been done by the Medical Entomologist, and his results are recorded under the report of the Section of Medical Entomology. Not only has the district between Nairobi and Fort Hall been kept under observation, but data as to mosquito distribution has been obtained from other areas, notably Nakuru, Kisii and Mombasa. With the advent of a second Entomologist it is hoped in 1928 to enlarge the area from which data are being obtained, as the advantage of the increase in staff will not be felt in 1927 owing to the Senior Entomologist's departure on leave. A group of Kavirondo natives on an estate a few miles from Nairobi has been kept under observation during the year. Blood examinations have been made of those boys at regular intervals. Up to the time of writing the results obtained have been somewhat contradictory to conclusions which were drawn in previous years and suggest that the examination of a single slide from a case of malaria is of comparatively little use, and also that, at any rate in Africans, the presence of malarial parasites in the blood even in considerable numbers, does not necessarily give rise to symptoms even of malaize. The difficulty of estimating the relative amount of incapacity due to malaria and to intestinal parasites is almost insurmountable under the conditions in which these boys live. Unfortunately the promise on which this investigation was begun on the Sisal estate in question, of being able to treat natives found infected with intestinal parasites, has not materialized, and at the end of the year we are still in the position of finding malaria parasites and intestinal worms without any



prospect of being able to treat the patients efficiently or even at all. There are hopes, however, that in the early months of 1927 the hospital on the estate will be opened under the care of a semi-trained European staff, and if so it will then be possible to obtain data from boys living under natural conditions as to the results of deparasitization and of the rate at which re-infection occurs.

(c) YAWS.

Reference to the work done in this disease throughout the year will be found under the Serological Section, and it is hoped that during 1927 Dr. Allen, who has been in charge of the investigations, will be able to publish a complete account of his work.

(d) INTESTINAL HELMINTHS.

A certain amount of data have been obtained from the prison, from the estate already mentioned under (b) above, and, outside the Laboratory Staff, by Dr. Carman of the Medical and Mr. Daubney of the Veterinary Department from the inmates of the Reformatory at Kabete. Exact conclusions up to the present are impossible, but sufficient facts are available to show that intestinal helminths are probably playing a very important part in reducing the physique of Africans in this Colony. The work which has already been commenced is being carried on and extended during 1927.

(c) DIET AND DISEASE.

The visit of Dr. Orr of the Rowett Institute, Aberdeen, gave a great stimulus to discussion as to the effect that diet was having on the physique of Africans and as to whether food deficiency was not possibly one of the causes of the prevalence of ulcers amongst the native population. For the investigation of this question analysis of all local foodstuffs was indicated, but it was obvious that in the Laboratory, we possess neither accommodation nor staff to carry this piece of research to a successful conclusion. Similarly it was also felt that the question of the effect of diet on ulcers was so large and involved so much work that it was beyond the possibility of immediate investigation unless the staff was increased. These two pieces of research work have been undertaken by research workers from the United Kingdom. One of these, Dr. Henderson, arrived in October and began the investigation of the causation of ulcers in the African population, and it is understood that another medical officer from England will be available early in 1927 to collaborate with a medical officer seconded from the Medical Division for the collection of local foodstuffs, arrangements for the despatch to England of these samples being made by the Laboratory Staff.

The possibility, however, of arranging an experiment as to the effect of different diets on prisoners in Nairobi was considered within the powers of the Biochemical Staff of the Laboratory. A start was made with these experiments just before the close of the year when forty-two long term prisoners of approximately the same physique, undertaking work of approximately the same character and drawn from closely allied tribes, were selected, and after a preliminary investigation of their infection with intestinal helminths, malarial parasites and the parasites of Yaws and Syphilis, they were divided up into six groups of seven men, all on the same diet, namely, that laid down by the Prison Ordinance for long term prisoners, but with the addition of certain supplements in the case of four of the groups. It is hoped also in 1927 to supplement this investigation by animal experiments.

(f) PLAGUE.

For some time past there has been a suspicion that the efficacy of the plague vaccine issued by the Laboratory in the production of immunity has not been as great as one would have liked. After considerable discussion it was decided, therefore, to give up the method of manufacture detailed in the Annual Report for 1923, and to produce a vaccine on the lines of that made by the Haffkine Institute in India. A considerable amount of time has been spent during the latter half of the year in determining the best culture medium, the optimum period and temperature for growth of the plague bacilli, and the necessary time required in this climate for the toxicity of the vaccine to be reduced to the minimum. Judging by the results which have been reported up to the present time, the change has undoubtedly rendered the vaccine a better immunising agent. A considerable outbreak of plague occurred in Nairobi towards the end of the year, and this enabled us to use recently isolated strains in the production of the vaccine.

(g) GENERAL.

At a meeting held in June, 1926, the question of a programme of research was discussed and it was recognised that research investigations can be broadly divided into two groups, namely, (1) those aimed at securing reliable data on which to base our knowledge of the distribution and epidemiology of disease, and



(2) those aimed at the elucidation of a specific problem arising in connection with these diseases. It was decided that the following work should be commenced this year.

#### MALARIA. GROUP I. INVESTIGATION.

- (a) Comparison and experimental control of mosquito conditions in a sisal estate, a mixed Native and European area, and a purely native area.
- (b) Comparison of infectivity rate of mosquitoes in these areas at different periods of the year.
- (c) Mosquito survey of Kenya.

#### GROUP II. INVESTIGATION.

- (a) Intensive study of mosquito conditions in Nairobi in connection with control, infectivity of species, and larvicides.
- (b) Estimation of value for clinical diagnosis of malarial parasite cultivation.
- (c) Estimation of value for clinical diagnosis of differential leucocyte counts.

#### PLAGUE. GROUP I. INVESTIGATIONS.

- (a) Flea survey of Kenya.
- (b) Wild rodent survey of plague areas of Kenya if official can be borrowed from South Africa.

#### GROUP II. INVESTIGATIONS.

- (a) Comparison of protection afforded in experimental animals against lethal dose of plague bacilli by prophylactic inoculation of Kenya, South Africa and Haffkine's vaccine.
- (b) Tests of protection afforded by prophylactic inoculation of Kenya vaccine when changes made in method of preparation.
- (c) Experiments in conjunction with sanitation division on flea and rat conveyance by maize and cotton seed.
- (d) Assisting sanitation division in experiments on feasibility of fumigating maize or cotton seed in bulk.

#### ULCERS. GROUP I. INVESTIGATION.

- (a) Examination of labour at Kalimoni Estate on various diets to compare incidence of ulcers.
- (b) Observation of ulcer cases at Kalimoni Estate under various methods of treatment.

#### GROUP II. INVESTIGATIONS.

- (a) Investigation of selected cases illustrating various types of ulcer as regards bacteriology, histology and metabolism.
- (b) Examination of cases at Kalimoni Estate of injury by sisal thorns and sequence of events when wounds untreated.

#### YAWS. GROUP II. INVESTIGATIONS.

- (a) Assistance to Medical Officer, i/c., V. D. Clinic, by estimation of results of Wassermann, Sigma and Kahn re-actions of cases before, during and at varying periods after various treatments to enable him to determine the average number of doses of drugs required for complete cure, removal of clinical signs, or removal of infectivity, the rapidity of relapse after insufficient treatment, and the refractoriness to subsequent treatment of partially treated cases.
- (b) Estimation of relative values of Wassermann, Sigma, Kahn, Meinicke and other serological re-actions in diagnosis and in recording effect of treatment.

#### HELMINTHIASIS. GROUP I. INVESTIGATIONS.

- (a) Examination for Helminths of all labour on Kalimoni Estate and inmates of Reformatory on admission and at regular intervals thereafter.
- (b) Estimation of relative efficiency and sick rate of groups of disinfested and infested labour at Kalimoni Estate and Reformatory.
- (c) Determination of rapidity of re-infestation at Kalimoni Estate and Reformatory before and after institution of various sanitary precautions.



- (d) Routine examination for helminths of all persons admitted to the Native Civil Hospital, Nairobi, and comparison of results with physical signs.

#### NUTRITIONAL PROBLEMS. GROUP I. INVESTIGATIONS.

- (a) Analysis of all local foodstuffs.
- (b) Observation of effects of various dietaries on long term prisoners and youths in Reformatory.
- (c) Observation of effects of experimental diets on animals.

#### PATHOLOGY. GROUP I. INVESTIGATIONS.

- (a) Routine Post Mortem examinations (when possible) of all patients dying at the Native Civil Hospital, Nairobi, and publication of quarterly reports thereof.

#### TRYPANOSOMIASIS. GROUP II. INVESTIGATIONS.

- (a) Detection of Food Hosts of the tsetse fly by application of precipitin test to stomach contents.

#### RHEUMATOID ARTHRITIS. GROUP II. INVESTIGATIONS.

- (a) Typing of coliform organisms already isolated.
- (b) Determination of metabolism in cases with especial regard to a possible upset of Ca metabolism, and to the possible advantage of parathyroid therapy.

#### "INFLUENZA." GROUP II. INVESTIGATION. (When plague investigation is finished.)

- (a) Investigation of the bacteriology and cytology of blood, secretions and excretions of cases with especial regard to the possibility of a casual filterable virus.

Unfortunately, owing to the transference of one of the staff to the Sanitation Division it has been impossible to carry out quite as much work as was expected. A considerable portion of the programme has been commenced, however, and some of the Group II. investigations should be completed during 1927. Naturally it is impossible to indicate a definite time-table for the whole scheme of research as it depends upon several factors, among which may be mentioned:

- (a) The possibility of more urgent problems arising.
- (b) Maintenance of the full senior and subordinate staff at 1927 strength.
- (c) Amount of co-operation available from the clinical and sanitary staff of the Department.

Unfortunately it would seem that the officers in the Medical and Sanitation Divisions have their hands so fully occupied with clinical and sanitation work that it is almost impossible for them to supply the necessary assistance to make certain investigations into the problems of clinical pathology a feasible proposition. Although those problems in many cases stand in urgent need of elucidation, the Laboratory Staff in the absence of co-operation is naturally thrown back upon research work which can be carried out solely with Laboratory resources, a result which tends to make research academic rather than practical. If the scheme whereby the new Laboratory building is sited in the neighbourhood of the combined hospital in Nairobi comes to fruition, then it will be possible for the Laboratory staff to carry out a considerable amount of the clinical work for themselves, hence one cannot urge too strongly the early commencement on the new building scheme for the combined hospital and laboratory in Nairobi.

After a considerable amount of thought, a scheme whereby medical research in the Colonies could be co-ordinated, and an amalgamated Colonial Research Service organised was discussed with the Director of Medical and Sanitary Services just prior to his departure on leave. The ideas put forward met with his whole-hearted support, and it is hoped that as the result of his advocacy of the suggestion, research work will be placed on a more secure basis than has been the case in the past.

### B. SEROLOGICAL SECTION.

#### (I) YAWS AND SYPHILIS.

In the report for 1925 reference was made to an attempt which was in progress to investigate the relationship existing between these diseases and certain serological tests, and to discover how far these tests were influenced by treatment with bismuth. This investigation has been continued in 1926, and



although definite conclusions have not yet been reached, it is hoped to publish at an early date a preliminary report of the results obtained. It is disappointing that more information as to the effect of bismuth on Yaws and Syphilis is not available, but the reasons given in the Annual Report for 1925 for this comparative failure of the investigation still hold good.

The number of sera received has been the largest on record. This has been due to the interest taken in the question by several Medical Officers. Dr. Jobson (Machakos) sent in a large number of sera, accompanied by excellent notes of the cases, and has taken very considerable trouble to follow up patients and have them examined both clinically and serologically after bismuth treatment. Dr. Davies and Dr. Carman have given invaluable assistance by having all the Syphilis and Yaws patients admitted to the Infectious Diseases Hospital, Nairobi, examined before, during and after treatment. Unfortunately the information obtained from other sources than these has been so meagre as to be practically useless, and a very much larger number of blood examinations could have been made if the sera had been available.

The tests used during the year have been the Wassermann Reaction, the Sigma Reaction and the Kahn test. For working out the effect of treatment the Sigma test has been proved to be infinitely the best. The Kahn test would appear to be the most accurate rapid method for diagnosis, but was not found as reliable as the other two methods. A few sera were tested by the Webb Method, but as it seemed inferior to the Kahn test it was not adopted. A comparison of the value of these tests will be included in the report mentioned previously.

Total number of sera examined	...	...	1,710
WASSERMAN REACTION.			1,569
Positive	...	...	695
Negative	...	...	674
SIGMA REACTION.			829
Positive	...	...	542
Negative	...	...	287
KAHN REACTIONS.			355
Positive	...	...	247
Negative	...	...	108
Total number of Tests performed	...	=	2,753

## (2) AGGLUTINATIONS.

Each serum has been tested against *B. typhosus*, *B. paratyphosus A*, *B. paratyphosus B*, *B. melitensis*, *B. paramelitensis*, *B. abortus* and *B. proteus X 19*. The Dreyer technique was used for the first three organisms, and the Garrow technique for the remainder. A comparison of the Dreyer and Garrow techniques was carried out, and the results were published in the *Kenya Medical Journal*, Volume III., December, 1926, pages 245 to 256.

## SUMMARY OF RESULTS.

Total number of sera tested	...	...	...	181
Number agglutinating <i>B. typhosus</i>	...	...	...	35
Number agglutinating <i>B. paratyphosus A</i> .	...	...	...	6
Number agglutinating <i>B. paratyphosus B</i> .	...	...	...	2
Number agglutinating <i>B. melitensis</i> )	...	...	...	4
Number agglutinating <i>B. abortus</i> )	...	...	...	1
Number agglutinating <i>B. paramelitensis</i>	...	...	...	1
Number agglutinating <i>B. proteus X. 19</i>	...	...	...	1
Number negative	...	...	...	132

## C. CALF LYMPH SECTION.

### (1) STAFF.

The staff has consisted of one Indian Laboratory Assistant (Mr. Pema) and four Africans. Mr. Pema in addition has been in charge of the experimental animals. The work of the Section has been under the direction of the Senior Bacteriologist.

### (2) BUILDINGS.

The new building for calves awaiting vaccination has been in continuous use. There is now sufficient accommodation for calf lymph requirements, but the type of building is unsatisfactory, and the calf stalls are constantly under repair.



(3) CALVES.

As in previous years the calves have been obtained on hire from the Kyambu and Dagoretti native reserves, through the courtesy of the District Commissioner, who has maintained the supply required.

The number of calves received was 171, of which 108 were vaccinated. One calf died of East Coast Fever while awaiting vaccination.

(4) PRODUCTION OF CALF LYMPH.

The method of production was the same as described in previous years.



TABLE I.

"B." STRAIN, 1926.

765 (9.8 V.G.)										814 (Septic.)	
771 (14 G.)										809 (9.0 G.)	
774 (18.5 V.G.)										804 (Septic)	
777 (22.5 F.)										803 (11.5 V.G.)	
778 (9.0 F.)										802 (12.5 V.G.)	
815 (13.2 V.G.)										804 (Septic)	
784 (11.5 V.G.)										814 (Septic.)	
819 (10 V.G.)										809 (9.0 G.)	
818 (14 V.G.)										804 (Septic)	
821 (10.5 G.)										814 (Septic.)	
826 (12 G.)										809 (9.0 G.)	
827 (9.7 F.)										804 (Septic)	
837 (9 V.G.)										803 (11.5 V.G.)	
838 (14 V.G.)										802 (12.5 V.G.)	
839 (16 G.)										804 (Septic)	
845 (6.5 V.G.)										803 (11.5 V.G.)	
844 (5.5 V.G.)										802 (12.5 V.G.)	
850 (11 V.G.)										804 (Septic)	
851 (14 V.G.)										809 (9.0 G.)	
R26 (V.G.)										804 (Septic)	
871 (19 G.)										803 (11.5 V.G.)	
872 (10 V.G.)										802 (12.5 V.G.)	
873 (8 G.)										804 (Septic)	
870 (11 V.G.)										809 (9.0 G.)	
882 (13 V.G.)										804 (Septic)	
883 (7 G.)										803 (11.5 V.G.)	
884 (8. G.)										802 (12.5 V.G.)	
885 (10 G.)										804 (Septic)	
894 (7 G.)										809 (9.0 G.)	
895 (10 V.G.)										804 (Septic)	
896 (15 V.G.)										803 (11.5 V.G.)	
897 (14 G.)										802 (12.5 V.G.)	
906 (Failed)										804 (Septic)	
907 (8 G.)										809 (9.0 G.)	
908 (18 V.G.)										803 (11.5 V.G.)	
909 (Failed)										802 (12.5 V.G.)	
919 (18 V.G.)										804 (Septic)	
920 (25 Septic)										809 (9.0 G.)	
921 (13 G.)										804 (Septic)	
922 (8 G.)										803 (11.5 V.G.)	
923 (7 G.)										802 (12.5 V.G.)	
933 (8 V.G.)										804 (Septic)	
934 (7 V.G.)										809 (9.0 G.)	
935 (11 V.G.)										803 (11.5 V.G.)	
936 (15 G.)										802 (12.5 V.G.)	
937 (8 V.G.)										804 (Septic)	







TABLE III.

" Z " STRAIN, 1926.

761 (7.2 V.G.)		806 (12 V.G.)	
788 (15.5 V.G.)	776 (13 G.)	782 (11 V.G.)	805 (12 V.G.)
792 (N.C.)			796 (14.5 G.)
			799 (13 G.)
			811 (10 V.G.)
			813 (12 V.G.)
857 (8 G.)	858 (9 G.)	847 (18 G.)	823 (6.2 G.)
		848 (7 G.)	R27 (V.G.)
			849 (17 V.G.)
			875 (10 G.)
			876 (9 V.G.)
			824 (10 V.G.)
			877 (Failed)
			825 (Septic)
			830 (14.5 G.)
			831 (Septic)
			840 (7 G.)
			832 (Septic)
			833 (Septic)
			842 (Septic)
			874 (14 V.G.)
			905 (10 G.)
			904 (11 G.)
			902 (Failed)
			901 (10 G.)
			900 (13 V.G.)
			899 (10 F.)
			898 (12 V.G.)
			881 (29 V.G.)
			880 (8 G.)
			879 (13 G.)
			878 (17 V.G.)
			924 (15 V.G.)
			925 (10 V.G.)
			926 (12 G.)
			927 (11 V.G.)
			928 (8 G.)
			929 (17 F.)
			930 (13 V.G.)
			931 (10 V.G.)
			932 (16 F.)







TABLE IV. VACCINATION RETURN, 1926.

STATIONS.	Total No. of doses issued.	Total Number vaccinated.	SEX.			AGE.			RACE.				PRIMARY VACCINATION.				RE-VACCINATION.				PREVIOUS VACCINAL CONDITIONS.			
			Male.	Female.	Unknown.	Adult.	Child.	Unknown.	European.	Asiatic.	African.	Unknown.	Total.	Successful.	Failed.	Unknown.	Total.	Successful.	Failed.	Unknown.	Total.	Successful.	Failed.	Unknown.
Eldoret	...	...	524	353	353	—	—	353	—	—	—	353	—	—	—	—	353	236	27	90	—	—	—	—
Fort Hall	...	...	156	172	172	—	—	172	—	—	—	172	—	121	82	39	51	27	24	—	—	—	—	—
Kakamega	...	...	18,068	3,176	2,658	518	—	2,274	902	—	—	3,176	—	1,948	1,482	8	458	1,228	28	66	1,134	—	—	—
Kapsabet	...	...	252	157	154	3	—	150	7	—	—	157	—	157	141	13	3	—	—	—	—	—	—	—
Kericho	...	...	640	—	—	—	—	—	—	—	—	†	—	—	—	—	—	—	—	—	—	—	—	—
Kijabe	...	...	46	3	3	—	—	—	3	—	1	2	—	3	3	—	—	—	—	—	—	—	—	—
Kisii	...	...	5,200	1,848	1,846	2	—	1,667	181	—	—	3	1,845	—	493	2	—	491	1,355	—	1	1,354	—	—
Kisumu	...	...	78,000	15,261	15,248	13	—	15,261	—	—	—	15,261	—	14	14	—	—	493	238	133	122	14,754	—	14,754
*Kitui	...	...	780	248	242	6	—	240	8	—	—	248	—	114	89	25	—	134	92	42	—	—	—	—
Lamu	...	...	2,400	166	162	4	—	160	6	—	—	165	—	50	—	—	50	116	—	—	116	—	—	—
*Machakos	...	...	244,610	786	785	1	—	741	45	—	—	785	—	267	90	10	167	515	194	117	204	4	1	3
Malindi	...	...	950	10	9	1	—	10	—	—	—	10	—	10	9	—	1	—	—	—	—	—	—	—
Mombasa	...	...	28,500	8,778	—	—	8,778	—	37	6,544	2,197	—	—	—	—	—	—	—	—	—	8,778	309	72	8,397
Meru	...	...	1,840	1,055	932	123	—	964	91	—	—	736	319	923	117	33	775	9	—	9	123	—	—	123
Med. Res. Laboratory	...	...	103	97	97	—	—	97	—	—	—	97	—	47	47	—	3	—	—	3	—	47	13	30
Nairobi (M.O.H.)	...	...	8,948	3,496	2,168	479	849	2,230	534	732	68	75	3,353	—	262	132	39	91	1,401	404	509	488	1,833	53
Nakuru	...	...	5,200	531	531	—	—	531	—	—	—	531	—	38	37	—	1	493	461	12	20	—	—	—
Narok	...	...	8,300	3,913	1,018	1,211	1,684	1,402	827	1,684	—	—	2,229	1,684	1,103	—	—	1,103	—	—	—	—	2,810	53
Nyeri	...	...	1,500	1,450	1,274	176	—	1,315	135	—	—	1,450	—	1,450	1,089	18	343	—	—	—	—	—	—	—
Voi.	...	...	5,200	253	218	35	—	219	34	—	—	16	204	33	113	84	1	28	140	23	17	100	—	—
Dr. J. B. Clarke (Nairobi).	...	...	39	4	3	1	—	1	3	—	4	—	—	4	4	—	—	—	—	—	—	—	—	—
Dr. S. D. Karve	...	...	53	7	3	4	—	—	7	—	—	6	1	—	7	7	—	—	—	—	—	—	—	—
Zanzibar	...	...	55,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Various	...	...	512	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL.	...	466,821	41,764	27,876	2,577	11,311	27,787	2,783	11,194	111	6,647	32,970	2,036	7,124	3,429	186	3,509	6,291	1,703	951	3,637	28,349	429	115

\*Vaccinations performed by mobile vaccination team in native reserves, not recorded in above table:—

Machakos Akamba. ... 151,658  
 Kitui. ... 22,000  
 TOTAL. ... 173,658

† Returns not received.







## (3) SUMMARY OF CALF LYMPH PRODUCTION IN 1926.

Number of calves vaccinated	...	...	...	...	168
Number of calves vaccinated successfully	...	...	...	...	152
Number of grammes of pulp collected	...	...	...	...	1,839.3 gms.
Average number of grammes of pulp per calf	...	...	...	...	10.9 gms.
Number of doses manufactured	...	...	...	...	551,790
Number of doses issued	...	...	...	...	455,050
Number of doses in stock at end of 1926	...	...	...	...	541,890
Cost of Calf Lymph production	...	...	...	...	£559-4-0
Cost per dose manufactured	...	...	...	...	0-2 pence.
Cost per dose issued	...	...	...	...	0.29 penny

## D. PATHOLOGICAL SECTION.

## (1) HISTOLOGICAL EXAMINATION.

One hundred and ninety-two pathological specimens were submitted for histological examination. Of these forty-two were from Europeans, three from Asiatics, one hundred and twenty-four from Africans and the remainder from animals. The details of the results of the examinations are as follows:—

## EUROPEANS.

Appendix	...	...	Total	14	No histological abnormality	...	9
					Subacute inflammation	...	2
					Acute inflammation	...	1
					Chronic inflammation	...	1
					Post-operative necrosis	...	1
Tumours	...	...	Total	19	Non-malignant	...	16
					Malignant	...	3
Lymphatic Glands	...	...	Total	4	Normal	...	1
					Chronic inflammation	...	2
					Secondary carcinoma	...	1
Curettage	...	...	Total	3	Non-malignant	...	3
Tonsil	...	...	Total	1	Chronic inflammation	...	1
Fallopian Tube	...	...	Total	1	Chronic inflammation	...	1
			Grand Total	42	Government Medical Officers' patients	...	26
					Private Practitioners' patients	...	13

## AFRICANS.

Tumours	...	...	Total	44	Sarcoma	...	18
					Carcinoma in Ulcers	...	4
					Primary Carcinoma of Liver	...	2
					Other Carcinomata	...	13
					Benign	...	7
Granulomata	...	...	Total	15	Tuberculosis	...	8
					Leprosy	...	4
					Hodgkin	...	3
Protozoal Infections	...	...	Total	10	Trypanosomiasis	...	1
					Malaria	...	9
Other Diseases	...	...	Total	55	Peritonitis	...	5
					Myeloid Leukaemia	...	1
					Purpura	...	1
					Ulcers	...	11
					Various	...	37
			Grand Total	124	From Government Medical Officers' patients	...	105
					From Mission Hospitals	...	19

## ASIATICS.

Tumours	...	...	Total	3	Chronic inflammation	...	1
					Tuberculosis	...	1
					Carcinoma	...	1
			Grand Total of specimens	3	Government Medical Officers' patients	...	2
					Private Practitioners' patients	...	1



## ANIMALS.

	Trypanosomiasis				Monilia			
Rats	...	...	...	12	...	...	...	—
Guinea pig	...	...	...	2	...	...	...	—
Rabbitt	...	...	...	—	...	...	...	1
Monkey	...	...	...	8	...	...	...	—

It will be noted that many of the specimens from Africans consist of malignant new growths, two of the cases being primary carcinoma of the liver.

## (2) POST-MORTEM EXAMINATIONS.

82 post-mortem examinations were carried out by the Laboratory staff during the year, of which 33 were undertaken at the request of the police. The following is a list of the results of the post-mortem findings:—

## ALPHABETICAL LIST OF POST-MORTEM FINDINGS.

	No. of cases.
Abscess, Cerebral	1
Aortic Aneurysm (Rupture of 1, Embolism Cerebral, from 1)	2
Asphyxia (Drowning, Suffocation, Electrocution)	3
Broncho-pneumonia	3
Broncho-pneumonia, Bronchitis, and Peribronchitis	1
Broncho-pneumonia, Malaria and Cirrhosis liver	1
Broncho-pneumonia and Chronic nephritis	1
Dysentery, Bacillary	1
Enteric Fever	1
Enteric Fever, Intestinal Perforation and General Peritonitis	1
Enteric Fever and Lobar pneumonia	1
Enteric Fever, Broncho-pneumonia and Malaria	1
Fracture of Skull with intracranial haemorrhage	4
Fracture of Lumbar spine	1
Fractures, Compound of limbs	1
Gangrene of Lung and Fracture of Skull	1
Gas Gangrene following fracture fibula (compound)	1
Heart, Chronic Endocarditis and Myocardial Degeneration	1
Malaria, cerebral	14
Malaria and Chronic Nephritis	1
Malaria, Cerebral and Pulmonary Tuberculosis	1
Nephritis, Acute	2
Nephritis, Chronic Intestinal	2
Pericarditis and Pleurisy	1
Peritonitis, General and Ascites, and Atrophy of Liver	1
Peritonitis, General and Cirrhosis of Liver	1
Peritonitis following Traumatic Rupture of Intestine	1
Plague, bubonic	4
Pneumonia, Lobar	4
Pneumonia, Lobar and Meningitis	2
Pneumonia, Lobar, Pleurisy and Pyaemia	1
Pneumonia, Lobar, Meningitis, Malaria, Chronic Pericarditis and Nephritis	1
Pneumonia, Lobar, Acute Peri- and Endocarditis, Pleurisy and Peritonitis	1
Pneumonia, Lobar (bilateral), Acute Pleurisy "Septic" Spleen, and Fatty Degeneration of Liver	1
Pneumonia, Lobar and Malaria	1
Pneumonia, Lobar, Pleurisy and Pericarditis	1
Pneumonia, Lobar, Pleurisy and Trypanosomiasis	1
Pneumonia, Lobar and Peritonitis	1
Poisoning by Barium Sulphide	1
Pyaemia—Streptococcal (from ulcer foot)	1
Spleen—Rupture of	1
Sarcoma—Osteosarcoma thigh and Secondary Sarcoma of Lung	1
Stillbirth	1
Tetanus and Subtertian Malaria	1
Tuberculosis—Peritonitis	1
Tuberculosis—Pulmonary	1
Tuberculosis—Miliary	1
Wounds—Blood vessels of Neck—Haemorrhage	2
Wounds—Lung, Heart and Liver	1
Cause of death obscured by decomposition	1
Wounds—Lung	1
Total number Post-mortem Examinations	82



During the first part of the year it was possible to arrange for an officer of the Laboratory staff to undertake a post-mortem examination of practically every case that died in the Native Civil Hospital, Nairobi. Many of these gave rise to very interesting pathological problems. After the disorganisation which followed the transfer of Dr. Hunter to the Sanitation Division it was only possible to make post-mortem examinations in the more interesting cases. The medico-legal cases gave rise to one or two interesting problems, notably one case in which stab wounds occurred and it was important to determine in which direction the blows had been delivered, and which of the wounds was given first. The remarks that were made last year in regard to the lack of facilities provided for post-mortem examinations still hold good, no improvements having been effected either at the Town Mortuary or at the Native Hospital. It is to be hoped that the building of the new combined hospital and Laboratory will get rid of the disabilities under which a pathologist labours at the present time.

## E. BACTERIOLOGICAL SECTION.

### (1) MICROSCOPICAL AND CULTURAL EXAMINATIONS.

Total examinations performed :—

Microscopical examinations	...	...	...	...	1,977
Cultural examinations	...	...	...	...	867

#### (1) ANTHRAX.

*B. anthracis* was detected in two specimens taken from persons affected with cutaneous ulcers or pustules.

#### (2) CEREBRO-SPINAL MENINGITIS.

Meningococci were cultivated from one specimen of cerebro-spinal fluid, and identified microscopically in two others, out of a total of seven cases of suspected posterior basal meningitis.

#### (3) DIPHTHERIA.

Out of a total of forty-eight specimens of pharyngeal exudate examined, Klebs-Löffler bacilli were identified in five.

#### (4) GONORRHOEA.

Gonococci were identified microscopically in 44 out of 132 specimens of urethral discharges from males, and in 1 out of five smears of vaginal discharge.

#### (5) LEPROSY.

Out of a total of 43 specimens of nasal discharge examined, *B. leprae* was identified microscopically in five.

#### (6) PATHOGENIC FUNGI.

A type of *Monilia* was identified microscopically and by culture in one specimen of sputum from a case of suspected pulmonary tuberculosis.

#### (7) PLAGUE. (a) IN MAN.

*B. pestis* was identified microscopically in one case of a direct blood film, in 12 out of 46 specimens obtained by gland puncture, in 15 out of 47 specimens of spleen from suspected cases post-mortem, in 2 out of 5 preparations from other organs, and in 4 out of 10 specimens of sputum examined.

#### (b) IN RATS.

Through the instrumentality of the Health Office, 1,280 rats were subjected to examination for the presence of plague infection. The bulk of this total was constituted by rats obtained by trapping: smears from the spleens of these were sent to the Laboratory for examination. In only two of these was microscopical evidence of plague infection found. In October the routine was instituted of sending to the Laboratory all rats found dead, for complete autopsy. Of these, nearly 25 per cent. were found to be plague-infected. The animals so examined form an important source of virulent *B. pestis* cultures necessary for the preparation of prophylactic plague vaccine. An income of *B. pestis* cultures for this purpose is derived also from pieces of spleen, etc., obtained from natives dying of plague at the Infectious Diseases Hospital.

#### (8) PNEUMOCOCCAL INFECTIONS.

Pneumococci were identified microscopically and by culture in three specimens of cerebro-spinal fluid, and in five specimens of sputum.



## (9) TETANUS.

*B. tetani* was obtained by culture in one instance, from an abscess following intra-muscular injection of quinine.

## (10) TUBERCULOSIS.

*B. tuberculosis* was identified microscopically in 34 out of 255 specimens of sputum examined; and in 2 out of 19 specimens of urine.

## (11) TYPHOID-COLON GROUP.

(a) *B. typhosus* was obtained by cultivation of the blood in 2 out of 9 cases.

(b) Dysentery.

Out of 26 dysenteric stools submitted for bacteriological examination, *B. dysenteriae* of Flexner type was isolated in 6 cases, of Shiga type in 2 cases, and anomalous organisms of dysenteroid character in 3 cases.

Of 275 stools examined from native hospital cases of all categories not exhibiting dysenteric symptoms, 30 per cent. were found to contain organisms of the non-lactose-fermenting section of the typhoid-colon group. None of these, however, were identifiable with any known pathogenic type, though some of them exhibited cultural reactions closely similar to those of the para-typhoid-Gaertner and dysenteric groups, and might conceivably be capable of a pathogenic role.

## (12) SEPTIC INFECTIONS.

Staphylococci were found by microscopical examination and culture in 6 specimens of pus, streptococci in 3, and *B. Welchii* in 1.

## (II). WATER ANALYSIS.

11 samples of water were examined bacteriologically during the year at the request of Medical Officers of Health, etc. The samples were taken from the following sources:—

Mombasa Water Supply	...	...	...	...	2 samples.
Kikuyu	...	...	...	...	1 sample.
Nairobi, various sources	...	...	...	...	6 samples.
Juja River and Wells, Kilimani Estate	...	...	...	...	2 samples.

## (III). TESTS OF DISINFECTANTS.

Four well-known types of Disinfectant were tested as to their phenol co-efficients by the Admiralty Method—employing as the test organisms a mixture of two strains of *B. typhosus* isolated from typhoid cases in Kenya. The results were as follows:—

Disinfectant.	Phenol Co-efficient.	Dilution Fatal to <i>B. typhosus</i> in ten minutes.
Type A.      ...    ...    ...    ...	5.0	1 in 500
Type B.      ...    ...    ...    ...	7.0	1 in 700
Type C.      ...    ...    ...    ...	11.0	1 in 1,100
Type D.      ...    ...    ...    ...	8.0	1 in 800

## IV. VACCINES.

## (1) CURATIVE VACCINE.

During the year curative vaccines were prepared for 89 courses of treatment. These were mostly of autogenous type, as below:—

(a) For Staphylococcal, Streptococcal and Catarrhal infections vaccines were prepared in 8 cases.

(b) Agglutinating Coliform Vaccine, for rheumatic conditions: vaccines for 61 courses of treatment were prepared. The excellent results often obtained with these put their value beyond doubt.

(c) Polyvalent Defatted Staphylococcal Vaccine: 20 courses.

## (2) PROPHYLACTIC VACCINES.

(a) T.A.B. A sufficient number of doses have been prepared for stock to meet the comparatively small demand.

(b) Plague Vaccine. 97,800 doses have been prepared during the year. Of these, 50,000 were prepared by the new method instituted on November 17th, whereby a vaccine is secured similar to that issued by the Haffkine Institute, Bombay.



## F. PROTOZOAL AND HELMINTHIC SECTION.

Total number of specimens examined ... ..	9,088
Total number of blood smears examined ... ..	5,554
Total number of faeces examined ... ..	3,428
Total number of smears from internal organs and ulcers	22
Total number of urines examined ... ..	11
Total number of blood specimens for total count ...	32
Total number of snails examined ... ..	40
Total number of smears for <i>Spermatozoa</i> ... ..	1
	<hr/> 9,088 <hr/>

## 1. PROTOZOA-MALARIA.

Total number of blood smears examined for malaria ... ..	5,470
Total number of blood smears in which parasites were found ...	2,333
Total number of blood smears in which parasites were not found ...	3,137

## 1. ANALYSIS OF THE EXAMINATIONS CARRIED OUT.

	Europeans.	Asiatics.	Natives.	Total.
<i>P. falciparum</i> ... ..	332	136	1,776	2,244
<i>P. vivax</i> ... ..	13	9	15	37
<i>P. malariae</i> ... ..	5	1	32	38
<i>P. vivax</i> & <i>P. malariae</i> ...	1	0	0	1
<i>P. vivax</i> & <i>P. falciparum</i> ...	4	0	2	6
<i>P. malariae</i> & <i>P. falciparum</i> ...	0	0	5	5
<i>P. falciparum</i> & <i>S. Rossi</i> ...	0	0	2	2
Negative ... ..	355 831	146 263	1,832 2,043	2,333 3,137
Totals ...	1,186	409	3,874	5,470

## 2. THE MONTHLY INCIDENCE OF MALARIA.

	<i>P. falciparum.</i>	<i>P. vivax.</i>	<i>P. Malaria.</i>	Mixed Infections.
January ... ..	91	1	3	—
February ... ..	103	1	3	—
March ... ..	96	5	3	1
April ... ..	136	5	5	—
May ... ..	179	4	1	—
June ... ..	296	4	4	5
July ... ..	415	3	2	2
August ... ..	232	3	6	4
September ... ..	179	2	6	—
October ... ..	176	3	3	1
November ... ..	177	2	1	—
December ... ..	164	4	1	1
Total ...	2,244	37	38	14

## 3. SOURCE OF SPECIMENS SENT FOR EXAMINATION.

A sample of 1,000 consecutive specimens are grouped under the sources from which they were derived.

736 (73.6%) Native Civil Hospital, Nairobi.

106 (10.6%) European Hospital, Nairobi.

74 (7.4%) Jail, Police, Prison, Asylum and Native Dispensary, Nairobi.

30 (3.0%) Laboratory, Nairobi.

41 (4.1%) European Practitioners, Nairobi.



- 5 (0.5%) Kisii, Native Civil Hospital.  
 2 (0.2%) Voi.  
 2 (0.2%) Up-country Practitioners.  
 1 (0.1%) Mombasa Native Civil Hospital.  
 1 (0.1%) Fort Hall, Native Civil Hospital.  
 1 (0.1%) Nyeri.  
 1 (0.1%) Taveta.

#### 4. DIFFERENTIAL LEUCOCYTE COUNTS.

(a) *Analysis of all Differential Counts performed.*

		Negative.	P. falciparum.	P. vivax.	P. malaria.	Mixed Infections.
Europeans	...	651	165	6	2	1
Asiatics	...	165	80	7	1	0
Natives	...	1,012	428	4	10	1
		1,828	673	17	13	2

Total Differential Counts=2,534.

(b) *Percentage of Large Mono nuclear Leucocytes in cases of infection with P. falciparum.*

			No. of Smears.	Maximum Percentage.	Minimum Percentage.	Average. Percentage.
Europeans	...	...	165	28	3	11.5
Asiatics	...	...	80	23	5	11.4
Natives	...	...	428	29	2	11.9

(5) *Smears from Internal Organs.*

Positive 11. Negative 6. Total 17.

(6) *Table illustrating the incidence of Malaria from 1911—1926.*

Year.			P. falciparum.	P. malariae.	P. vivax.	Mixed Infections.
1911	...	...	238	13	25	—
1912	...	...	209	13	19	—
1913	...	...	174	4	12	—
1914	...	...	218	10	10	—
1915	...	...	814	22	61	—
1916	...	...	655	27	176	—
1917	...	...	881	11	607	—
1918	...	...	435	7	308	—
1919	...	...	540	12	900	—
1920	...	...	224	10	44	—
1921	...	...	83	4	19	—
1922	...	...	130	0	20	2
1923	...	...	187	22	30	4
1924	...	...	308	19	47	4
1925	...	...	288	10	18	2
1926	...	...	2,244	38	37	14

#### (II). RELAPSING FEVER.

S. rossi was found in 67 smears, three examinations being negative. In 2 cases S. rossi was associated with P. falciparum, and in one case with F. bancrofti.



## (III). EXAMINATION OF URINE.

(a) Ten specimens of urine were examined for ova of *Schistosoma haematobium*, six being positive.

(b) Specimens of *Gordius aquaticus* (?) were sent for examination. These were stated to have come from the bladder of an European woman. This assertion was found to be incorrect.

## (IV). TOTAL BLOOD COUNTS.

Thirty-two complete counts were performed, which included one case of pernicious anaemia and one of lymphatic leukaemia.

## (V). INTESTINAL PROTOZOA AND HELMINTHS.

## (1) SINGLE INFECTIONS.

(a) *Helminths*.

Taenia	...	...	...	...	...	...	399
Ascaris	...	...	...	...	...	...	152
Ancylostoma	...	...	...	...	...	...	151
Trichuris	...	...	...	...	...	...	139
Strongyloides	...	...	...	...	...	...	48
Schistosoma Mansoni	...	...	...	...	...	...	37
Heterodera radicola	...	...	...	...	...	...	4
Oxyuris	...	...	...	...	...	...	1
Hymenolepis nana	...	...	...	...	...	...	1
							<hr/> 932 <hr/>

(b) *Protozoa*.

E. Coli	...	...	...	...	...	...	183
Flagellates undifferentiated	...	...	...	...	...	...	18
Giardia intestinalis	...	...	...	...	...	...	27
Iodamoeba butschlii	...	...	...	...	...	...	15
Eimeria steidae	...	...	...	...	...	...	7
Endolimax nana	...	...	...	...	...	...	3
E. histolytica	...	...	...	...	...	...	3
Embodomonas intestinalis	...	...	...	...	...	...	1
Trichomonas hominis	...	...	...	...	...	...	1
							<hr/> 258 <hr/>

## (2) DOUBLE INFECTIONS.

(a) *Helminths*.

Taenia and Ancylostoma	...	...	...	...	77
Taenia and Trichuris	...	...	...	...	67
Taenia and Ascaris	...	...	...	...	34
Taenia and Schistosoma Mansoni	...	...	...	...	12
Taenia and Strongyloides	...	...	...	...	11
Ascaris and Trichuris	...	...	...	...	84
Ascaris and Ancylostoma	...	...	...	...	41
Ascaris and Strongyloides	...	...	...	...	7
Ascaris and Schistosoma Mansoni	...	...	...	...	2
Ancylostoma and Trichuris	...	...	...	...	48
Ancylostoma and Strongyloides	...	...	...	...	6
Trichuris and Strongyloides	...	...	...	...	5
Trichuris and Schistosoma Mansoni	...	...	...	...	5
Oxyuris and Schistosoma Mansoni	...	...	...	...	1
					<hr/>
					400

(b) *Protozoa*.

E. Coli and Iodamoeba butschlii	...	...	...	...	10
E. Coli and Flagellates undifferentiated	...	...	...	...	5
E. Coli and Endolimax nana	...	...	...	...	3
E. Coli and Giardia intestinalis	...	...	...	...	4
E. Coli and E. histolytica	...	...	...	...	2
E. Coli and Chilomastix mesnili	...	...	...	...	1
E. histolytica and Giardia intestinalis	...	...	...	...	1



E. histolytica and Iodamoeba butschlii	...	...	1
E. histolytica and Flagellates undifferentiated	...	...	1
Iodamoeba butschlii and Endolimax nana	...	...	1
Giardia intestinalis and Flagellates undifferentiated	...	...	1
			<hr/> 30 <hr/>

## (3) TRIPLE INFECTIONS.

(a) *Helminths.*

Taenia, Trichuris and Ancylostoma	...	...	...	34
Taenia, Trichuris and Ascaris	...	...	...	20
Taenia, Ancylostoma and Ascaris	...	...	...	20
Taenia, Ancylostoma and Strongyloides	...	...	...	5
Taenia, Ancylostoma and Schistosoma Mansoni	...	...	...	3
Taenia, Ascaris and Strongyloides	...	...	...	2
Ascaris, Ancylostoma and Trichuris	...	...	...	28
Ascaris, Strongyloides and Trichuris	...	...	...	2
Ascaris, Strongyloides and Schistosoma Mansoni	...	...	...	2
Ascaris, Strongyloides and Ancylostoma	...	...	...	1
Ascaris, Schistosoma Mansoni and Ancylostoma	...	...	...	1
Ascaris, Oxyuris and Ancylostoma	...	...	...	1
Ancylostoma, Trichuris and Strongyloides	...	...	...	3
Ancylostoma, Schistosoma Mansoni and Strongyloides	...	...	...	1

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123

(b) *Protozoa.*

E. Coli, Giardia intestinalis and E. Coli	...	...	1
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## (4) QUADRUPLE INFECTIONS.

(a) *Helminths.*

Taenia, Ascaris, Ancylostoma and Trichuris	...	...	14
Taenia, Ascaris, Schistosoma and Trichuris	...	...	1
Ascaris, Ancylostoma, Trichuris and Strongyloides	...	...	2
Ascaris, Ancylostoma, Trichuris and Schistosoma	...	...	1
Ascaris, Ancylostoma, Trichuris and Heterodera	...	...	1
			<hr/> 19 <hr/>

(b) *Protozoa.*

E. Coli, E. histolytica, I. butschlii and Endolimax nana.	1
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## (5) QUINTUPLE INFECTIONS.

(a) *Helminths.*

Taenia, Ascaris, Ancylostoma, Trichuris and Schistosoma	...	...	...	...	...	1
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(b) <i>Protozoa</i>	...	...	...	...	...	Nil.
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## (6) MIXED INFECTIONS OF HELMINTHS AND PROTOZOA.

(a) *One Protozoa and One Helminth.*

E. Coli and Taenia	...	...	...	...	76
E. Coli and Trichuris	...	...	...	...	21
E. Coli and Ancylostoma	...	...	...	...	27
E. Coli and Ascaris	...	...	...	...	19
E. Coli and Schistosoma Mansoni	...	...	...	...	7
E. Coli and Strongyloides	...	...	...	...	5
E. Coli and Dipylidium	...	...	...	...	1
E. Coli and Oxyuris	...	...	...	...	1
I. butschlii and Taenia	...	...	...	...	4
I. butschlii and Ancylostoma	...	...	...	...	3
I. butschlii and Trichuris	...	...	...	...	2
I. butschlii and Ascaris	...	...	...	...	1
Giardia intestinalis and Taenia	...	...	...	...	5



Giardia intestinalis and Ancylostoma	...	...	...	2
Endolimax nana and Taenia	...	...	...	4
Endolimax nana and Ancylostoma	...	...	...	2
Flagellates (undifferentiated) and Ancylostoma	...	...	...	2
Flagellates (undifferentiated) and Trichuris	...	...	...	2
Flagellates (undifferentiated) and Strongyloides	...	...	...	2
Flagellated (undifferentiated) and Taenia	...	...	...	1
Chilomastix mesnili and ancylostoma	...	...	...	2
Chilomastix mesnili and Taenia	...	...	...	1
E. histolytica and Taenia	...	...	...	1
E. histolytica and Trichuris	...	...	...	1
				<hr/>
				192
				<hr/>

(b) *One Protozoa and Two Helminths.*

E. Coli, Taenia and Ancylostoma	...	...	...	13
E. Coli, Taenia and Trichuris	...	...	...	12
E. Coli, Taenia and Ascaris	...	...	...	9
E. Coli, Trichuris and Ascaris	...	...	...	5
E. Coli, Ancylostoma and Ascaris	...	...	...	4
E. Coli, Ancylostoma and Trichuris	...	...	...	4
E. Coli, Taenia and Schistosoma Mansoni	...	...	...	3
E. Coli, Ancylostoma and Strongyloides	...	...	...	2
E. Coli, Ascaris and Strongyloides	...	...	...	1
E. Coli, Trichuris and Strongyloides	...	...	...	1
E. Coli, Trichuris and Schistosoma Mansoni	...	...	...	1
E. Coli, Ancylostoma and Heterodera	...	...	...	1
Giardia intestinalis, Taenia and Trichuris	..	...	...	1
Giardia intestinalis, Ascaris and Ancylostoma	..	...	...	1
Flagellates (undifferentiated), Ascaris and Ancylostoma	..	...	...	1
Flagellates (undifferentiated), Ascaris and Trichuris	...	...	...	1
Flagellates (undifferentiated), Taenia and Trichuris	...	...	...	1
Chilomastix mesnili, Ancylostoma and Trichuris	...	...	...	1
Endolimax nana, Trichuris and Taenia	...	...	...	1
Endolimax nana, Trichuris and Ascaris	...	...	...	1
Endolimax nana, Trichuris and Ancylostoma	...	...	...	1
Iodamoeba butschlii, Trichuris and Taenia	...	...	...	1
Iodamoeba butschlii, Trichuris and Ancylostoma	...	...	...	1
Iodamoeba butschlii, Ascaris and Ancylostoma	...	...	...	2
				<hr/>
				69
				<hr/>

(c) *One Protozoa and Three Helminths.*

E. Coli, Taenia, Ascaris and Ancylostoma	...	...	...	3
E. Coli, Taenia, Ascaris and Trichuris	...	...	...	3
E. Coli, Taenia, Ancylostoma and Trichuris	...	...	...	2
E. Coli, Ascaris, Strongyloides and Trichuris	...	...	...	2
E. Coli, Taenia, Strongyloides and Heterodera	...	...	...	2
E. Coli, Taenia, Ancylostoma and Schistosoma	...	...	...	1
E. Coli, Trichuris, Ancylostoma and Strongyloides	...	...	...	1
I. butschlii, Ascaris, Ancylostoma and Trichuris	...	...	...	2
I. butschlii, Ascaris, Taenia and Trichuris	...	...	...	1
I. butschlii, Ancylostoma, Strongyloides and Schistosoma	...	...	...	1
E. histolytica, Ancylostoma, Ascaris and Trichuris	...	...	...	1
Enteromonas hominis, Ancylostoma, Taenia and Trichuris	...	...	...	1
Chilomastix mesnili, Ancylostoma, Taenia and Ascaris	...	...	...	1
Flagellates (undifferentiated), Trichuris, Taenia and Ascaris	...	...	...	1
				<hr/>
				22
				<hr/>

(d) *One Protozoa and Four Helminths.*

I. butschlii, Taenia, Ascaris, Ancylostoma and Schistosoma Mansoni	...	...	...	...	1
Endolimax nana, Taenia, Ascaris, Ancylostoma and Trichuris	...	...	...	...	1
				<hr/>	2
				<hr/>	



(e) *Two Protozoa and One Helminth.*

E. Coli, I. butschlii and Taenia	...	...	...	4
E. Coli, I. butschlii and Ascaris	...	...	...	2
E. Coli, I. butschlii and Trichuris	...	...	...	1
E. Coli, Chilomastix mesnili and Taenia	...	...	...	2
E. Coli, Chilomastix mesnili and Trichuris	...	...	...	1
E. Coli, Endolimax nana and Taenia	...	...	...	2
E. Coli, E. histolytica and Taenia	...	...	...	1
I. butschlii, Giardia intestinalis and Ascaris	...	...	...	1
I. butschlii, Giardia intestinalis and Strongyloides	...	...	...	1
I. butschlii, Chilomastix mesnili and Ancylostoma	...	...	...	1
I. butschlii, Embadomonas intestinalis and Ancylostoma	...	...	...	1
				<hr/> 17 <hr/>

(f) *Two Protozoa and Two Helminths.*

E. Coli, Flagellates, Ancylostoma and Trichuris	...	...	...	2
E. Coli, Flagellates, Ascaris and Trichuris	...	...	...	1
E. Coli, Giardia, Ascaris and Ancylostoma	...	...	...	1
E. Coli, I. butschlii, Taenia and Ancylostoma	...	...	...	1
E. Coli, I. butschlii, Trichuris and Ancylostoma	...	...	...	1
E. Coli, I. butschlii, Trichuris and Strongyloides	...	...	...	1
				<hr/> 7 <hr/>

(g) *Two Protozoa and Three Helminths.*

E. Coli, I. butschlii, Ascaris, Ancylostoma and Trichuris	...	...	...	...	...	...	3
E. Coli, Flagellates, Taenia, Strongyloides and Trichuris	...	...	...	...	...	...	1
							<hr/> 4 <hr/>

(h) *Two Protozoa and Four Helminths.*

E. Coli, I. butschlii, Taenia, Ascaris, Ancylostoma and Trichuris	...	...	...	...	...	...	...	1
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(i) *Three Protozoa and One Helminth.*

E. Coli, Chilomastix mesnili, Endolimax nana and Trichuris	...	...	...	...	...	...	1
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(j) *Four Protozoa and One Helminth.*

E. Coli, I. butschlii, Chilomastix, Giardia and Taenia	...	...	...	...	...	...	1
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## (7) NUMBER OF CASES IN WHICH THE INDIVIDUAL PARASITES WERE FOUND.

(a) *Helminths.*

Taenia	...	...	...	...	...	...	862
Trichuris	...	...	...	...	...	...	530
Ancylostoma	...	...	...	...	...	...	516
Ascaris	...	...	...	...	...	...	484
Strongyloides	...	...	...	...	...	...	120
Schistosoma Mansoni	...	...	...	...	...	...	87
Heterodera Tadicola	...	...	...	...	...	...	7
Oxyuris	...	...	...	...	...	...	4
Hymenolepis nana	...	...	...	...	...	...	1
Dipylidium Caninum	...	...	...	...	...	...	1

(b) *Protozoa.*

E. Coli	...	...	...	...	...	...	462
I. butschlii	...	...	...	...	...	...	64
Giardia intestinalis	...	...	...	...	...	...	47
Flagellates undifferentiated	...	...	...	...	...	...	40
Endolimax nana	...	...	...	...	...	...	21
E. histolytica	...	...	...	...	...	...	14
Chilomastix mesnili	...	...	...	...	...	...	12
Eimeria steidae	...	...	...	...	...	...	7
Embadomonas intestinalis	...	...	...	...	...	...	2
Enteromonas hominis	...	...	...	...	...	...	1
Trichomonas hominis	...	...	...	...	...	...	1



## (8) SUMMARY OF FAECAL EXAMINATIONS.

Negative	...	...	...	...	...	1,334
Single Infections Helminths	...	...	...	...	...	932
Single Infections Protozoa	...	...	...	...	...	258
Double Infections Helminths	...	...	...	...	...	413
Double Infections Protozoa	...	...	...	...	...	30
Triple Infections Helminths	...	...	...	...	...	123
Triple Infections Protozoa	...	...	...	...	...	1
Quadruple Infections Helminths	...	...	...	...	...	19
Quadruple Infections Protozoa	...	...	...	...	...	1
Quintuple Infections Helminths	...	...	...	...	...	1
One Protozoa and One Helminth	...	...	...	...	...	192
One Protozoa and Two Helminths	...	...	...	...	...	69
One Protozoa and Three Helminths	...	...	...	...	...	22
One Protozoa and Four Helminths	...	...	...	...	...	2
Two Protozoa and One Helminth	...	...	...	...	...	17
Two Protozoa and Two Helminths	...	...	...	...	...	7
Two Protozoa and Three Helminths	...	...	...	...	...	4
Two Protozoa and Four Helminths	...	...	...	...	...	1
Three Protozoa and One Helminth	...	...	...	...	...	1
Four Protozoa and One Helminth	...	...	...	...	...	1
						<hr/> 3,428 <hr/>

## OTHER EXAMINATIONS.

			Positive.	Negative.	Total.
(VI)	Trypanosomiasis.	Blood Smears T. Gam- biense	3	2	5
(VII)	Leishmaniasis.	Smears from ulcers	0	5	5
(VIII)	Piroplasmosis.	Blood Smears P. Canis...	3	0	3
(IX)	East Coast Fever.	Blood Smear T. Parva	1	1	2
(X)		Blood Smear (Horse) N. Equi	1	0	1
(XI)	Filariasis.		7 (F. Bancrofti F. Ozzardi)	4) 3)	7
(XII)	Schistosomiasis.	Snails (Planorbis Species?) Cercariae of Schisto- soma Mansoni	0	40	40
(XIII)	Other Examinations.	Paper for Spermatozoa...	1	0	1

## G. SECTION OF MEDICAL ENTOMOLOGY.

## (1) ORGANISATION.

The staff was increased at the beginning of the year by one European Laboratory Learner. The native staff has remained the same in number throughout the year.

This section will benefit greatly from the inauguration of an African Service with a definite period of enlistment. Under present conditions Africans appear to find some excuse for leaving just as they have become useful, and the very considerable time spent on their training is wasted.

Accommodation has not improved during the year, and this, together with the lack of facilities for insect breeding and experimentation deprives us of the results of intensive laboratory work on bionomics and transmission.

About nine weeks have been spent by the Medical Entomologist away from Nairobi on duty.

Some 10,000 insects have been received for identification during the year. These consisted mostly of mosquitoes and fleas submitted by medical officers who are co-operating in the work of this section.

## (2) TSETSE FLY.

Investigations and study in this direction have been curtailed as the result partly of the sudden rise into prominence of the Malaria problem and partly of the change of policy of the Department.

One visit was paid to the Lake Shore during March and April, for the purpose of keeping in touch with any possible change in tsetse fly conditions in the areas surveyed last year, and to collect further material for the investigation into the foods of *G. palpalis*.

On the Miriu river experimental clearing, the early attempts to induce the population to establish shambas had not been followed up, and the result was a



considerable regrowth of heavy shrub. At the time of the visit of the Medical Entomologist the river was teeming with small fish, and the population for miles around gathered in large numbers along the banks near the gorge every day for about a month 'scooping' up the fish in baskets. Tsetse flies were numerous and fed very freely on the people. That no outbreak of trypanosomiasis resulted seemed fairly conclusive proof that no infection existed in that spot. Professor Kleine's recent investigations in the same area definitely support this.

That the population is still making free use of the river is suggested by the recent application to the District Commissioner to be allowed to move their villages back to the sites occupied in 1920.

At Homa Point nearly a mile of shore was cleared under the supervision of Dr. Bevan. The present condition of this is unknown, as is also the smaller work started by Dr. Enzer at the Aloach river.

Whether or not warranted by the amount of existing Sleeping Sickness, the continuation of a minor scheme of reclamation in which the native population have already played no small part would appear to be essential to uphold the prestige of the Department and of the Government, to say nothing of its value as an agricultural measure.

The investigation into the food of *G. palpalis* is going on rather more slowly than was anticipated. The microscopical examination of some two hundred slides of the stomach contents of flies caught along the lake shore showed 35 per cent. mammalian blood. The differentiation of human and other mammalian blood cells derived from fly stomachs by microscopical methods was considered unreliable and the precipitin method has been adopted. The flies are caught and immediately dissected. If blood is visible in the stomach in sufficient quantity a smear is made of the stomach contents on a three-inch slide and allowed to dry. The actual test is carried out in Nairobi. Anti-human rabbit serum prepared under the direction of the Senior Bacteriologist gave positive results with 38 of the first batch of 154 smears = 24.6 per cent.

During August the Medical Officer, Northern Frontier District, reported the presence of *G. Morsitans* in the sandy river beds crossed by the Marsabit road north of the Uaso Nyero river. A few days therefore were devoted to a search on the Kauro river. *G. longipennis* only was found on both the Kauro and Uaso Nyero rivers. This species has also been received from Turkhana.

### (3) MOSQUITOES.

Surveys have been carried out in Nairobi, Fort Hall, Kiambu, on several sisal estates, in Kisumu, Kisii, Nakuru and on a section of the Mbagathi river. Larval collections are supplemented by adult catches from dwellings in the vicinity where possible.

In Nairobi a watch has been kept on mosquito breeding and activity throughout the year, and during the latter half the Medical Officer of Health has been supplied with information on which he has based his measures of control.

The work at Fort Hall has been carried out by trained natives under the Medical Officer, and has consisted of larval collections from definite chosen breeding grounds. The Nairobi—Fort Hall road survey was confined to a frequent and strict watch on one large and typical Sisal Estate and the periodical collections made by the Medical Officer, Fort Hall, on Estates between Thika and Fort Hall.

In Kisumu the Medical Officer of Health has carried out continuous collections of both larvae and adults. This work has been supplemented by two surveys by the Medical Entomologist for specific questions of control.

The Kisii investigations of mosquito conditions were started a few months ago, and the Medical Officer supervises the collections made by trained mosquito boys, and their submission to this Office.

Nakuru is one of several townships which it is hoped may benefit from small measures taken in time. A preliminary survey was undertaken in October, and simple measures were suggested for the control of domestic mosquitoes consisting of species of *Culex*, *Aedes* and a few *A. Costalis*.

The Mbagathi river is becoming the centre of an important settled area, the river valley itself offering considerable facilities for irrigation. In one section a papyrus swamp has been converted into an excellent 'shamba' but the result has been malaria as well as vegetables. Malaria is said not to have occurred in this area before.

Briefly the important data obtained during the year's work are as follows:—

- (1) *A. costalis* is produced in very large numbers during and after the long rains. This is true in all areas investigated.
- (2) *A. costalis* breeds in open, stagnant pools, and excavations such as



borrow pits, bad drains, irrigation canals, natural depressions and pools left by the partial drying up of rivers. The majority of these breeding grounds are man-made, particularly in the vicinity of towns and townships.

- (3) The *costalis* season of 1926 coincided with the season of the highest incidence of Subtertian Malaria. Adult catches in Nairobi during the 'epidemic' of malaria in April, May, June and July comprised over 95 per cent. *A. costalis*. A similar coincidence of the species and Malaria occurred in Kisumu and in the districts around Nairobi.
- (4) *A. costalis* is definitely a carrier of malaria in Nairobi. During the latter half of May, June and July microscopical examinations of 338 *costalis* adults caught in various selected native quarters in Nairobi showed 2 with oocysts and 2 with active sporozoites.
- (5) *A. costalis* has been pre-eminently the 'domestic' anopheline in Nairobi and the districts so far investigated during the period March to September.

*A. christyi* and *A. cinereus* have taken its place during the remaining months, though their actual numbers have been extremely low.

- (6) *A. funestus*, *transvaalensis* and *rhodesiensis* have been so rarely taken in dwellings that data on their activities are insufficient to warrant any conclusions as to their influence on malaria incidence. In Kisumu an extraordinary output of *A. funestus* occurred during the last five months of the year, due in great part to increased facilities for breeding. The Medical Officer of Health reports the definite finding of oocysts in two wild adult *A. funestus* though the very large numbers of this species appear to have influenced the malaria incidence very little. *A. rufipes*, *A. squamosus* and *A. maculipalpis* have been taken in dwellings on several occasions.
- (7) Larval catches have yielded in addition to the species mentioned—*A. mauritanus* and *A. pretoriensis* in several localities, and in considerable numbers.
- (8) The Anopheline mosquito species of Nairobi appear to be fairly typical of this part of the Highlands, but the numbers of species vary with the prevalence of certain types of breeding grounds. In Fort Hall there is at certain seasons a greater proportion of *A. pretoriensis* and *maculipalpis* than in Nairobi, due to the greater numbers of breeding grounds of the rock seepage and reedy type. The one constant characteristic of all areas appears to be the prevalence of *A. costalis* over all other species during and after the rains. The fact that Nairobi can be more intensely mosquito infested and more malarious than most other townships in the district is explained by reference to the very large numbers of *A. costalis* breeding grounds.
- (9) Papyrus swamps in themselves breed usually *A. mauritanus* and *A. maculipalpis* and a few *A. funestus* along the edges. They are in no way responsible for *A. costalis*, though the 'reclamation' of a swamp is often a conversion of conditions suitable to the former species into conditions very favourable to the prolific *A. costalis* and *A. christyi*.
- (10) In Kisii no *A. costalis* has up to the present been found, and the local carrier of malaria has yet to be discovered.

#### CONTROL.

The control of, or at least a very great reduction in the incidence of malaria would result from the elimination of *A. costalis*.

In Nairobi and Kisumu where ditches and pits have been in the making for years this calls for a considerable expenditure though no great engineering problems are involved. The smaller townships need experience no such difficulty or expense if with the making of roads, care be taken to avoid leaving pits and bad drains. Generally the 'natural' *costalis* breeding places comprise small open pools in swamps and drying up streams. These can frequently be rendered innocuous with very little trouble.

The estate problem is made worse by the strings of labour camps on or near the banks of streams which become converted thereby into a series of pools, puddles and stagnant cuttings, suitable for *costalis*, where previously the mosquito fauna consisted mostly of small numbers of *funestus*, *mauritanus* and *maculipalpis*.

At Kiambu, an attempt is being made to control malaria by simple draining and oiling. Two natives supplied by the District Commissioner have been trained in spotting larvae and applying oil. No results are yet obvious, since the work has not been going on sufficiently long. It is hoped by this experiment



to prove that any administrative officer in an outside district, with a minimum of expense, can reduce mosquitoes and malaria very considerably in his ' boma ' and at the same time carry out very valuable propaganda work in his district.

On the sisal estate singled out for particular attention, oiling has been adopted as a control measure though in a somewhat desultory fashion. Managers have only the very vaguest idea of their losses due to Malaria, and labour is still relatively very cheap and easily obtained: the work of educating these people is therefore likely to be prolonged.

In Kisumu the Medical Officer of Health carries out systematic oiling of all drains, pools and known breeding places. The presence of a long stretch of lake shore, much of which is papyrus and reed swamp, adds to the mosquito fauna by the addition of *A. pharoensis*, *mauritanus* and *maculipalpis* in considerable numbers, and in attempts to drain these shore areas large open cuttings have been made which hold stagnant water and so increase the *costalis* output. Following investigations into the role of the Lake shore in mosquito production, the Medical Entomologist recommended that the lake shore remain untouched, with as few open drains as possible, and that attention be directed rather to the numerous breeding grounds such as drains, pits and depressions in which *costalis* finds its optimum conditions.

#### PROPAGANDA.

Early in the year an attempt was made to institute methods of propaganda designed to educate the population in mosquito and malaria control. Lectures were delivered to the European, Indian and Native schools.

Suggestions for pamphlets, posters and cinema slides have been submitted for an assault on ignorance and inertia.

Data gathered on the bionomics of Anophelines—together with a key for the identification of adults and their full-grown larvae will be presented as soon as possible.

#### (4) TICKS.

No further work on *Ornithodoros moubata* has been possible beyond simple observations on longevity. From supplies of females submitted by Dr. Procter of Fort Hall in January ova were obtained from which nymphs were hatched in February. These were isolated under varying conditions on 27th February, 1926—some in dampened sand, and some in pill boxes with no other material. In all cases these nymphs have received no food whatever and at the time of writing (January 29th, 1927) all except a very few are still alive and quite active. The adults from which the ova were obtained lived without food for ten months after oviposition, whilst one female that had apparently not been fertilised is still alive and active after thirteen months. All specimens have been kept in the Laboratory in a closed glass cage.

#### (5) FLEAS.

The collection and identification of rat fleas have been carried out during the year in Machakos, and later in Kisii and Kisumu and Nairobi. Nearly 5,000 fleas have been dealt with.

IN MACHAKOS the collection has been made from rats caught in the dwellings and outhouses of Europeans, Asiatics and Africans in the township.

1,141 fleas were identified as follows:

<i>X. cheopis</i>	...	...	...	...	...	...	435
<i>X. brasiliensis</i>	...	...	...	...	...	...	303
<i>Echednophaga gallinaceus</i>	...	...	...	...	...	...	253
<i>Dinopsyllus lypusus</i>	...	...	...	...	...	...	72
<i>Ctenocephalus felis</i>	...	...	...	...	...	...	2
<i>Ctenocephalus canis</i>	...	...	...	...	...	...	22
<i>Ctenophthalinus sp.</i>	...	...	...	...	...	...	4
Damaged	...	...	...	...	...	...	50

The majority of rats caught were said to be *Rattus rattus kijabius*—the common domestic rat. There appears to be a definite increase in numbers of *X. cheopis* during December, January and May, whilst *X. brasiliensis* reaches its highest output in January, February, March, and September. *Echednophaga gallinaceus* was caught in largest numbers in April, May and June. *Dinopsyllus lypusus* occurs mostly and *Ctenophthalinus cabrius* almost entirely or *Arvicanthus sp.* and an increase in the capture of these species coincides with greater numbers of *Arvicanthus* during the latter part of the year.

No plague has occurred in Machakos during the year, so that the results of this work cannot be correlated with the disease.

From Kisii 635 fleas have been received taken from rats captured in the



boma since May. The following species occurred :—

<i>X. cheopis</i>	...	...	...	...	...	12
<i>X. brasiliensis</i>	...	...	...	...	...	442
<i>Echednophaga</i>	...	...	...	...	...	92
<i>Dinopsyllus lypusus</i>	...	...	...	...	...	48
<i>Ctenocephalus felis</i>	...	...	...	...	...	2
<i>Ctenocephalus canis</i>	...	...	...	...	...	5
<i>Ctenopsylla</i> sp.	...	...	...	...	...	1
<i>Ctenophthalinus cabrius</i>	...	...	...	...	...	2
Damaged	...	...	...	...	...	31

The great majority of rats caught were *Rattus rattus kijabius*. *X. brasiliensis* was captured in greatest numbers during May to August. No data exists for the months January to May.

Plague reached its peak in May and June in Kisii, and the locations in the immediate vicinity.

Catches of rats in villages definitely suffering from plague yielded the following fleas :—

<i>X. brasiliensis</i>	...	...	...	...	...	79
<i>Echednophaga</i>	...	...	...	...	...	25
<i>Dinopsyllus lypusus</i>	...	...	...	...	...	2
<i>Ctenocephalus felis</i>	...	...	...	...	...	1
<i>Ctenocephalus canis</i>	...	...	...	...	...	2

The very great majority of rats were returned as 'Black rats,' and several lots of specimens of these received for identification were *Rattus rattus kijabius*.

The collection from Kisumu included :—

<i>X. brasiliensis</i>	...	...	...	...	...	95
<i>X. cheopis</i>	...	...	...	...	...	74
<i>Echednophaga gallinaceus</i>	...	...	...	...	...	4
<i>Dinopsyllus lypusus</i>	...	...	...	...	...	2
Damaged	...	...	...	...	...	6

There is insufficient data to form any conclusion on seasonal prevalence of any species. The catches suggest that *X. brasiliensis* is most frequently found in native grass huts and bomas, whereas *X. cheopis* usually occurs in the more permanent type of buildings such as Indian dukas and African stone landies built by the Marine and Railway. In our catch in October, of twelve rats termed 'Black' 5 were captured in concrete landies and were infested by *X. cheopis* only: 7 caught in native bomas with the ordinary mud and grass huts produced *X. brasiliensis* only. This suggestion is supported by the South Kavirondo catches. In purely native bomas only *X. brasiliensis* was found, with two exceptions in the Homa Bay district where there are several Indian stores, and where 2 specimens of *X. cheopis* were caught.

In Nairobi no catches were possible until late in the year. 513 specimens were identified as follows :—

<i>X. cheopis</i>	...	...	...	...	...	222
<i>X. brasiliensis</i>	...	...	...	...	...	133
<i>Echednophaga gallinaceus</i>	...	...	...	...	...	123
<i>Dinopsyllus lypusus</i>	...	...	...	...	...	13
<i>Ctenocephalus canis</i>	...	...	...	...	...	4
<i>Ctenopsylla</i> sp.	...	...	...	...	...	1
<i>Ctenophthalinus</i> sp.	...	...	...	...	...	17

These catches were made during the plague outbreak, and as far as possible in 'plague' locations, but there is no evidence to show that *X. cheopis* is more closely associated with the outbreak than *X. brasiliensis* or vice versa.

The occurrence of *X. brasiliensis* in purely native huts and of *X. cheopis* in the more permanent types of buildings is again evidenced. At the moment the main points of interest are :—

(1) Both *X. cheopis* and *X. brasiliensis* appear to be associated with plague.

(2) On *Rattus rattus kijabius*, the prevalent rat in all areas investigated, *X. brasiliensis* is the flea of native bomas and native huts, whilst *X. cheopis* prevails in towns, and in the more permanent types of buildings such as African labour lines, Indian 'dukas,' and European residences.

(3) There is some evidence, though insufficient, of a definite rise in numbers of both *X. cheopis* and *X. brasiliensis* during the dryer months December to February and June to October, coinciding to an appreciable extent with the occurrence of 'plague.'

(4) *Dinopsyllus lypusus* and *Ctenophthalinus cabrius* are essentially ectoparasites of *Arvicanthus* sp. though the former occurs frequently on *Rattus rattus kijabius*.



No facilities exist for an intensive study of the bionomics of *Xenopsylla* species—a work of no little importance in the study of plague.

A presentation of the known data on fleas and plague in Kenya will be submitted during 1927.

#### (6) MYIASIS.

Two lots of specimens of larvae concerned with Myiasis were received during the year. Species of *Sarcophaga* were passed in stools by a patient in the Church of Scotland Mission Hospital suffering from “vague pains in abdomen: headaches and general malaise: no temperature, no diarrhoea or passing of blood and no sickness.”

Larvae of *Lucilia* and *Callephora* spp were obtained from a wound that had been inflicted three days previously.

#### (7) GENERAL.

There is evidence of a slightly greater appreciation by Medical Officers of the role of insects in the transmission of diseases, but not to the extent that would appear to be warranted by the enormous influence of insect-borne diseases in Public Health.

### H. BIOCHEMICAL SECTION.

Duties in the Biochemical-Section were taken over by the biochemist on the 22nd February, 1926. At the outset it was found necessary to have the Laboratory re-equipped and re-stocked, it having been out of use for some considerable time.

While this work of re-arrangement was in progress, routine examinations of urines, bloods and faeces were carried on with such apparatus and chemicals as were available, and certain other work for members of the Bacteriological Staff was undertaken as time permitted.

On the 15th May, in addition to Biochemical work, the biochemist took over the duties of the Government Analyst who proceeded on leave. These duties were carried out till the end of the year and necessarily restricted work in the Biochemical Section to what was immediate and essential.

Early in the year considerable interest was being evinced in the question of Native Diets and research with local nutritional problems was advocated. Consequently plans for a proposed scheme of investigation were submitted and approved. This scheme included (a) Analysis of Native Foodstuffs, (b) Practical Feeding Trials to be carried out at the Nairobi Prison, (c) Measurement of growth in Native Children, and (d) Certain other investigations on specific local nutritional problems.

In June, coincident with the drawing up of our scheme of nutritional research, a request was made by a committee of the Civil Research Council for laboratory accommodation for a biochemist who would assist in nutritional research, on the problem of ulcers in the African Native. This committee sent out an additional Biochemist—Dr. J. M. Henderson, M.D., D.Sc.,—who arrived on the 11th November, 1926.

In view of this, structural alterations in the Laboratory were found necessary to admit of two biochemists and one European assistant working in one room. These were approved and carried out by the Public Works Department between the 1st and 22nd of November. By the end of the year the laboratory, though too small for three workers, was well equipped for the type of research work intended and the sub-heads (a) and (b) of the scheme were begun by the existing laboratory staff, while Dr. Henderson had started his independent investigations with the causation of chronic ulcers in the African Native.

#### *Examinations carried out in Biochemical Section in 1926.*

Urines—General examination	...	...	...	...	112
Urines—Concentration of Urea	...	...	...	...	16
Faeces—General examination	...	...	...	...	7
Faeces—Fat estimation	...	...	...	...	2
Blood—Calcium estimation	...	...	...	...	4
Blood—Sugar estimation	...	...	...	...	1
Human Milk—General examination	...	...	...	...	6
Sugar Tolerance Curve	...	...	...	...	1
Blood—Carboxyhaemoglobin	...	...	...	...	2
Stomach Contents—Acidity	...	...	...	...	2

Besides these routine examinations a considerable amount of work was carried out on the Hydrogen Ion Concentration of waters for the Medical Entomologist, and on media for the Bacteriological Section. Metallic Bismuth suspended in Glucose for the treatment of Yaws was also prepared when required by various medical officers.



## I. ANALYTICAL SECTION.

The Government Analyst proceeded on leave on the 15th May, 1926. From that date till the end of the year the Biochemist undertook the work falling to this Section.

The analytical work carried out during the year was as follows :—

## (1) MILKS.

One hundred and ninety-five samples of cow's milk were examined, of which sixty-seven were adulterated. With the exception of two samples, which were analysed at the request of the Police, all these milks were examined for the Medical Officer of Health, Nairobi.

## (2) STAINS ON CLOTHING, ETC.

Thirty-eight exhibits were submitted by the Kenya Police to be examined for the presence of blood. Of these thirteen were positive and twenty-five negative. Four exhibits were submitted by the Police to be examined for seminal stains. Of these none were positive.

## (3) TOXICOLOGICAL EXAMINATIONS.

Thirty-six samples were submitted to be examined for suspected poisons. Three of these were sent by private individuals, the remainder by Government Officials. The samples included foodstuffs, native drugs, powders and viscera taken at post-mortem examinations. Six of the samples submitted were proved to contain poison, four being strychnine, one barium carbonate and one a poisoned arrow.

## (4) FOODS AND LIQUORS.

(1) The percentage of alcohol was determined in twelve samples of "tembo" (native liquor) for the Nairobi Municipality, and in two samples for the Kenya Police. The alcohol percentage was determined in four different samples from private persons.

(2) Four samples of Maize Meal were examined for spoilage and a report was made on four miscellaneous samples of foodstuffs as to their suitability for human consumption. A complete examination was made of three samples of Dried Meat for a private firm in Tanganyika Territory.

## (5) WATERS.

Fifty samples of Water were examined as to their suitability for drinking purposes. One sample was analysed for the Kenya and Uganda Railway, one for the Tanganyika Railway, seven for the Public Works Department, ten for the Health Department, ten for private individuals, six for the Municipal Engineer, Nairobi, and fifteen for a laboratory investigation into the extent of pollution of rivers by sisal effluent.

## (6) MINERALOGICAL SAMPLES.

Requests for identification of mineral specimens totalled eight. Reports were made on eight samples of limestones and sands as to their suitability for cement manufacture. This work was mostly done for the Public Works Department.

## (7) FUEL OILS.

Physical measurements were made from twelve samples of Fuel Oil. Seven of these were sent from the Kenya and Uganda Railway, the remainder from private individuals.

## (8) MISCELLANEOUS.

Sixteen miscellaneous samples were dealt with during the year.



